Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

VOLUME XXIV NUMBER 9

THE AGRICULTURAL STUDENT

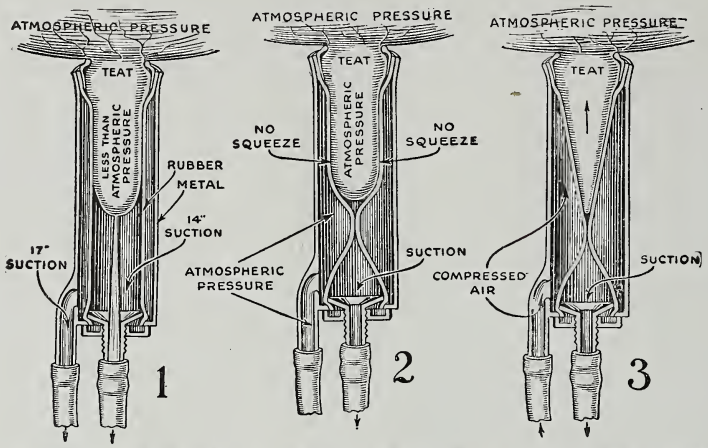
OHIO STATE UNIVERSITY, COLUMBUS, OHIO

MAY 1918

THIS issue is an expression of the work done by students in the Department of Agricultural Journalism, the articles having been contributed entirely by them. Many phases of farm life are created and it is hoped that this may show the practical side of an Agricultural College education. :: :: ::

15c PER COPY $1.00 PER YEAR

The Only Milker with a Positive Squeeze



1. *Suction* draws the milk from the udder of the cow. This principle is employed by every mechanical milker on the market, as well as by the calf when sucking from its mother.

2. Suction is shut off. Atmospheric pressure inside and outside teat, consequently *no squeeze* or massage can result. This is as far as other milkers go, because Sharples basic patents control use of compressed air.

3. *Compressed air* gives the "Upward Squeeze" which massages the teats and thus keeps them in perfect health. This action also insures faster milking and thus increases the milk flow. Found *only* in the Sharples Milker.

Sharples without the compressed air line will act *exactly* like other milkers on the market. But we know from experience that it is not enough. The

SHARPLES MILKER

gives in addition a *positive* "Upward Squeeze," for this reason: Drawing the milk from the udder down thru the teat, also draws blood from the veins of the udder down into the smaller veins of the teat. It is necessary that something shall keep massaging this blood back from the teat, to avoid congestion and to insure a healthy condition of the teat. The comfortable "Upward Squeeze" of the Sharples Milker does this.

You can help solve your labor problem by installing a Sharples Milker. It is so simple that a twelve-year-old boy or girl can operate it successfully. It will enable you to put more time in the field and get a bigger day's work from every team.

The Sharples Milker will also insure cleaner milk of a lower bacterial count. The milk passes through sterilized tubes into air-tight receivers.

Write today for Milker Catalog

THE SHARPLES SEPARATOR COMPANY WEST CHESTER, PA.

Sharples Separators—over a million users—the only separator that skims clean at any speed

BRANCHES: CHICAGO SAN FRANCISCO TORONTO

CM1

To My Son

Do you know that your soul is of my soul, such part
That it seems to be fibre and core of my heart?
None other can love me as you, dear, can do,
None other can please me or praise me, as you.

Remember the world will be quick with its blame,
If shadow or stain ever darken your name;
Like mother, like son, is a saying so true,
The world will judge largely of mother by you.

Be yours, then, the task, if task it may be,
To force this proud world to do homage to thee;
Be sure it will say when its verdict you've won:
"She reaped as she sowed; lo! this is her son."

The above is the creed of a Boys' Summer Camp in Michigan.

JOHN F. STONE

General Agent of the Equitable Life Insurance Company of Iowa

Will Pay Five Dollars in Gold

to any student of the University or reader of the Agricultural Student who sends the best poem before June 1st, 1918, using the words "Daughter" and "Father" instead of "Son" and "Mother" as above. Any part of the above creed may be used by the contestant, but the meter and rythm must be as perfect as that used above.

Address, 411-413 Citizens Building, Columbus, Ohio.

GOODMAN BROTHERS

JEWELERS

No 98 North High St.

The Great Dairy Question~

Where Is My Profit

Feeding grain to your cows is what eats your profits. International Special Dairy Feed not only saves the grain for you to sell at present high prices but also brings you more milk. Many dairymen report getting two quarts more from each cow every day because they feed this milk-making ration.

INTERNATIONAL
Special Dairy Feed

costs less per ton than grain. It is a scientific blend of choice grain products, cottonseed meal and molasses. It stimulates the appetite, keeps the bowels open and the cows in good health. And it is **guaranteed** to increase the flow of milk.

Order NOW! You can't afford to keep on losing money. So don't pass up this opportunity to **make** money and lots of it. Go to the nearest International dealer and order a ton. If you can't find one, send your order direct. Act now before the growing demand makes it harder to get. ***Agents Wanted.***

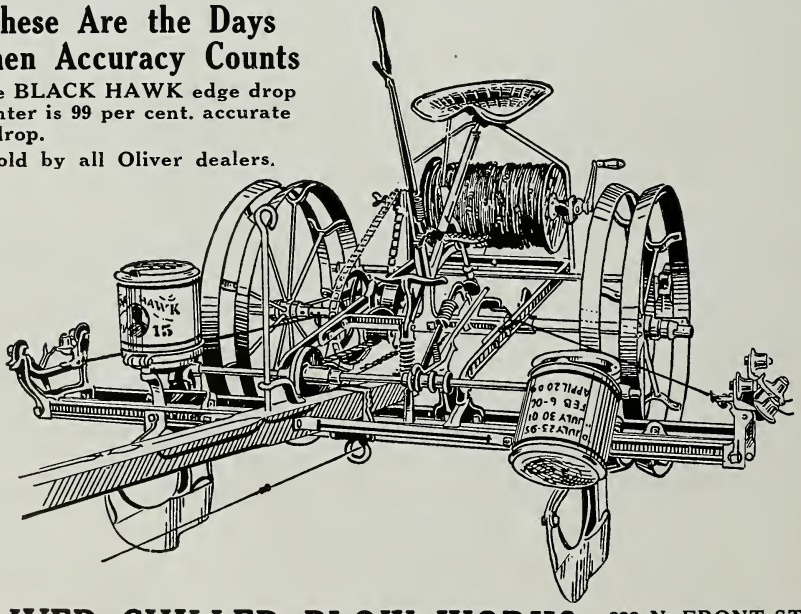
INTERNATIONAL SUGAR FEED CO.
Minneapolis, Minn.
Mills at Minneapolis and Memphis

~and the answer is-THERE!

These Are the Days When Accuracy Counts

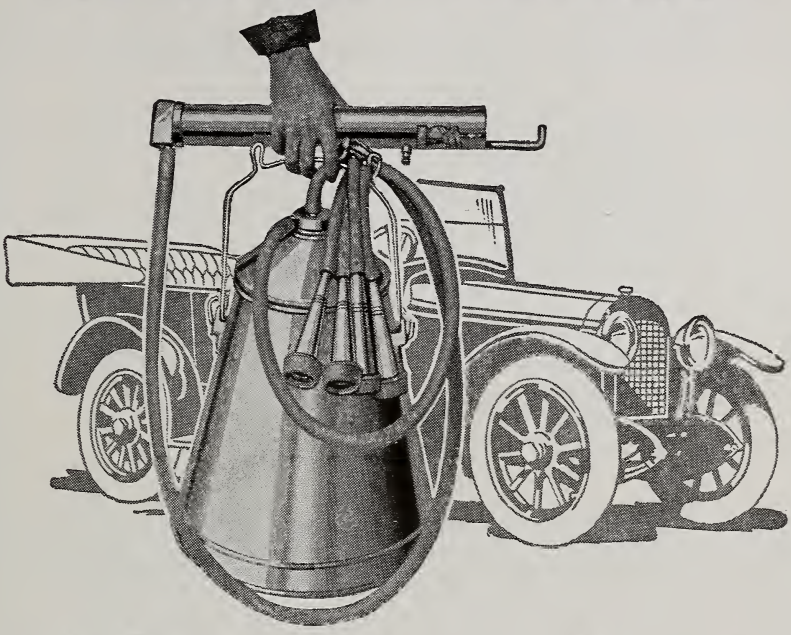
The BLACK HAWK edge drop planter is 99 per cent. accurate of drop.

Sold by all Oliver dealers.



OLIVER CHILLED PLOW WORKS, 333 N. FRONT ST. COLUMBUS, OHIO

The New
HINMAN MILKER



Will Help You Buy Your Automobile

The experience of HINMAN users proves that this Single Unit Individual Pump-Valve Chamber Milker means substantial increase on milk checks and dairy profits from the day the machine starts work.

Because: The HINMAN saves labor and labor cost. One man or even a boy can milk 18 to 25 cows an hour.

Because: The HINMAN will help improve your herd. You can easily weed out the unprofitable cows with this single unit machine. Each cow's milk is kept separate. One operator handles 3 units and has ample time to weigh and keep records of each individual cow.

Because: The HINMAN costs so little to buy and keep up—due to simplicity. No air pipe lines or vacuum tanks are required. Nothing to get out of order.

Write For Our Big FREE Catalog

and learn about the experience of prominent dairymen and profits they are making since using the HINMAN Individual Pump-Valve Chamber Milker. Even if you milk only six cows—the HINMAN will be a big factor in helping you buy your automobile.

R. L. Hinman offers you this catalog FREE

HINMAN MILKING MACHINE COMPANY

114-24 Elizabeth St. Oneida, N. Y.

Some good territory open for live agents

Maplecrest Pontiac Hartog

Son of Pontiac Aaggie Korndyke

Sir Pietertje Ormsby Mercedes 40th

Son of Sir Pietertje Ormsby Mercedes

Combining the blood of two great yearly herds. These are our herd sires

	Fat		Fat
Lucile Jolie Pontiac	**938**	**Ona Button De Kol**	**1076**
Early Dawn Peep 2d	**1030**	**Ona Clothilde Wayne**	**1013**

Wonderful yearly producers mated with these sires carry on the work of making the yearly record the real test of the Holstein cow.

We have one or two bulls that you will be interested in. Their pedigrees are well worth investigating and the bulls are mighty pleasing individuals, too. Write us about them.

PETER SMALL

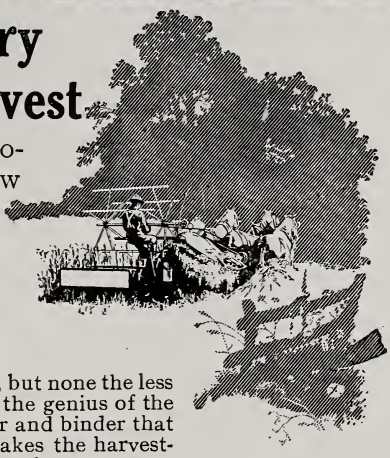
CHESTERLAND, OHIO.

THE PFEIFER PRESS

PRINTERS

COLUMBUS, OHIO.

No Worry About Harvest



HAVE you noticed how discussion of the food supply situation seems to center around the number of acres it is possible to plant rather than around the harvesting of those planted acres?

It is an unconscious, but none the less wonderful, tribute to the genius of the inventors of the reaper and binder that the American public takes the harvesting of the greatest grain crop ever planted as a matter of course. The sole question now is, "How many acres can we plant?" The power and help required by the planting will be amply sufficient for the harvest where **Champion, Deering, McCormick, Milwaukee** or **Osborne** binders and binder twine are used.

And, where they are used, the harvest will be complete. No matter whether the grain be tall or short, heavy or light, standing or down, lodged and tangled, an International Harvester binder cuts and binds it all without waste.

It is an easy matter to be fully prepared for harvest. Buy the largest binder you can use. An 8-foot is better than a 7, and a 7 better than a 6 or 5 because the larger sizes conserve labor. Buy a new machine if there is any question about the efficiency of the old one. There is a limit, you know, to the dependability of repaired machines, while a new one is absolutely reliable.

Through our 90 branch houses and over 30,000 dealers, we furnish promptly either new machines or repairs for old ones. Do not hesitate to call on our organization for any help we can give in the harvesting of this year's grain crop—the most important crop ever raised. See the local dealer or write us direct.

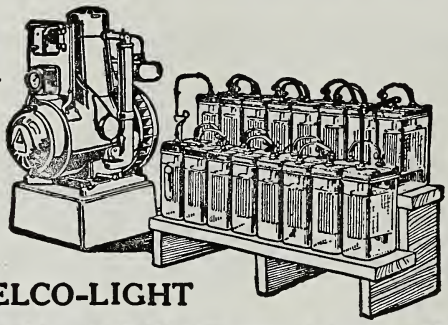
International Harvester Company of America
(Incorporated)

CHICAGO U S A

Champion Deering McCormick Milwaukee Osborne

DELCO-LIGHT

ELECTRICITY FOR EVERY FARM



DELCO-LIGHT

PUMPS THE WATER

OPERATES THE ELECTRIC FAN

OPERATES THE CHURN

"The Best Lighted Farm in the County"

One prominent farmer says:

"Delco-Light has actually added to the value of my farm—

"The neighbors speak of it as the best lighted farm in the county—

"But it is more than that—it is the best place in which to live—and to raise a family."

Delco-Light brings city comforts and conveniences and economies to the farm.

It lights the house and barn—it furnishes power to pump the water, wash the clothes, churn the butter, separate the cream—run the vacuum cleaner and the electric fan.

It is so simple that a child can operate it and so economical that it actually pays for itself in time, labor and fuel saved.

OHIO DISTRIBUTORS

J. J. Munsell, 11 E. Rich, Columbus
W. F. Gray, 201 Huron Rd., Cleveland
Jos. Herzstam, 134 E. Third, Dayton
E. H. Walker, 212 N. Erie, Toledo

There's a DEALER in Your County.

... Contents ...

Page

METHODS OF FEEDING DAIRY CALVES—
Roy E. Moser 521

POULTRY AT THE OHIO STATE UNIVERSITY—
Ralph H. Sturgeon 524

MAINTAINING THE FERTILITY OF THE SOIL—
E. J. Grener 526

SPRAYING THE POTATO CROP—
R. L. Sunderland 532

BENEFITS OF SOY BEANS—
L. N. Geiger 536

ADVERTISING MILK PRODUCTS—
C. H. Sprague 540

TRACTOR TEST ON THE UNIVERSITY FARM—
James A. Howenstine 542

EDITORIALS 546

HOME ECONOMICS 549

TEN GREAT DUROC BOARS—
W. A. Harper 552

DIFFERENT USES FOR THE POWER SPRAYER—
Gordon Dixon 554

UNIVERSITY PERCHERONS—
William C. Skelley 566

CORNER POSTS—
H. D. F. Pinkley 567

THE
AGRICULTURAL STUDENT

Vol. XXIV. OHIO STATE UNIVERSITY, COLUMBUS, MAY, 1918 *No. 9*

METHODS OF FEEDING DAIRY CALVES

How the Calves Should Be Handled From Birth Until They Are Past the Weaning Period; Substitutes That May Be Used for Whole Milk in the Rations

ROY E. MOSER, '18

THE question of feeding the dairy calf is an important one since the milk is worth so much more than the calf that it receives the first consideration. In a sense the care of the calf should begin before it is born. In endeavoring to raise good, thrifty calves many dairymen handicap themselves at the start by not properly feeding the pregnant cow. The food elements necessary for the development of the calf are taken into the stomach of the cow, digested, assimilated, and transmitted to the calf through the umbilical cord, the connection between the mother and the calf. It is evident, therefore, that if the cow does not receive food enough to keep herself in thrifty condition and at the same time develop her calf, both she and the calf must suffer. Such a cow should have an abundance of palatable and succulent or juicy feed in order to insure good body flesh and healthy, thrifty condition at calving time. The calves will then be well developed, strong, sturdy, and ready to respond normally to proper feed and care.

The dairy calf is almost always reared by hand. The longer it sucks the more difficult it will be to teach it to drink. On the other hand, the first milk of the cow possesses properties which stimulate the calf's stomach and other digestive organs to action. The milk is nature's physic and for this reason the young calf should always receive the mother's milk at first. The calf is sometimes weak at birth, and for this reason should have nourishment as soon as possible. It is usually easier to induce the calf to suck the cow than to try to make it drink from the pail. Because of these facts most dairymen prefer to let the calf remain with its mother for about 48 hours, immediately after birth. In the case of a weak calf or one that does not gain strength readily it may be best to allow it to remain longer than 48 hours, although under such circumstances it is sometimes difficult to teach the calf to drink, and serious trouble may result from its failure to obtain food.

Cleanliness is absolutely essential to the successful raising of calves. This is equally necessary in feed, pens, bedding, and pails or utensils. All milk fed should be fresh and clean, and the same is true of other feeds. Great care should be taken in washing the milk pails. These should be thoroughly scalded with boiling water, or sterilized with steam if possible. Attention to these details is the best prevention of disease. Nearly all disorders or diseases of the calf are caused either directly or indirectly by the lack of cleanliness.

The quantity of liquid feed that a

calf needs depends upon the size and age of the calf and to some extent upon the kind and condition of the feed. At birth a 50 pound calf should have about 8 pounds a day, while a 100 pound calf should have about 12 pounds. Many beginners make the mistake of letting the calf have all the milk it wants. This would probably be all right if the calf were fed about every two hours as is the case when it runs with the cow. When a young calf which has been without feed for 12 hours or more is given all the milk it will take there is danger that it will gorge itself causing digestive troubles.

Care should be taken to see that any milk fed to the young calves is of uniform temperature of about 90 degrees Fahrenheit. Only milk of good quality should be fed, and the prevention of digestive troubles should always be uppermost in the mind of the feeder. The loss of development in the calf on account of a temporary reduction in the ration when for any reason it is sour or nearly so is much less than when the digestive system becomes disordered.

Under natural conditions the young calf receives nourishment every 2 or 3 hours. In hand feeding it is best to follow these conditions as closely as possible, but because of the trouble and expense involved it has been found impracticable to feed calves more frequently than three times a day, and in some cases only twice a day.

It is the practice of many dairymen to feed young calves three times rather than twice a day, because the better results obtained more than pay for the additional work. When this is done the periods between feeding should be as nearly equal as possible. The chief advantages of feeding in this manner are that the calf can not overload its stomach and that the digestion of the feed is more evenly distributed throughout the 24 hours. The importance of regularity in feeding can not be overemphasized.

It is a well established fact that a calf can be raised on skim milk equally as good as one nursed by its mother. At least four-fifths of all dairy calves are raised on separated milk, grain being fed to supply the fat removed. Usually it pays well to feed whole milk for about two weeks, at the end of which time separated milk may be used in part. The proportion of the latter may be gradually increased until at the end of the fourth week it is used altogether. No fixed rules of feeding, based upon age, can be given because the size and vigor of the calf must always be considered. Calves especially strong at birth may be put on separated milk entirely at two weeks of age, but this should not be attempted with weak ones. Unless the calf is in vigorous and thrifty condition, no attempt should be made to change to separated milk. This change should always be made gradually.

After the fifth week, separated milk may be fed entirely unless the calf is delicate. The quantity fed can be gradually increased until 18 to 20 pounds a day are given. It is not economical to feed more than this unless milk is plentiful.

The time that milk should be discontinued depends upon its cost in relation to the value of the calf, its breed, size, vigor, etc. The season in which it reaches the age of 6 months and the other feeds available at that time must also be taken into consideration. Six months is probably a good average age at which to wean calves from milk. When the best of hay, silage, and a good variety of grains are available, the calf may be weaned earlier than

when such feeds are lacking. The season of good succulent pasturage presents the best possible condition for weaning a calf, and when this exists the calf can be weaned earlier than when it is lacking.

Usually a vigorous calf begins during the second week to pick at the bedding or other material within its reach, and at that time both grain and roughage of the best quality should be provided. Clover hay, alfalfa hay, or if these are not available, the most palatable roughage on hand should be given the calf after the second week. If alfalfa is used, care should be taken that it does not cause scours; this feed should be fed sparingly at first and increased only after the calf gets accustomed to it. The essential points are that the roughage be of good quality and kept clean.

Silage may be given after the calf is one month old, but the utmost care should be observed to be sure that it is fresh from the silo. For this reason very young calves, except in the hands of a careful feeder, should not be fed silage. Generally there is no danger that the calf will get too much roughage if it is clean and properly fed.

If the calf has access to good pasture during the first six months it need not receive other roughage. Pastures used in summer should contain plenty of shade. It is not advisable, however, to have a calf under two months of age on pasture in the early spring.

Whole milk is "nature's balanced ration" for the calf. When skim milk is fed, other feeds are used to supply the fat which has been removed. Proprietary calf feeds or meals for feeding with separated milk have been put on the market. Many of these have merit, but by using the feeds usually found on the farm or in markets nearby, the farmer can generally mix a grain ration which is as good and costs less.

Wheat bran is a grain which is readily taken by young calves. Corn has an excellent physiological effect upon cattle of all ages and to a great extent may take the place of the fat removed from the milk. It is therefore one of the best grains to use with skim milk. Experiments in Virginia tend to show that corn fed to calves should be cracked rather than finely ground. Ground oats are also good for this purpose.

A mixture consisting of three parts cracked corn, one part wheat bran, and one part ground oats is recommended. One part of linseed meal may also be added.

When the calf is in its second week it should begin to receive grain, and when it is one month old it should eat about one half pound per day. After this time the quantity of grain may be gradually increased, feeding the calf all that it will take until 3 pounds per day is reached; this will probably be some time during the third month.

In dairy herds in which the entire output is sold as whole milk at high prices there is a strong demand for feeds to take the place of the milk fed to the calves. The time at which calves can be put on milk substitutes depends upon the same factors as in the use of separated milk, namely, the breed, development, and vigor of the calves. It is hardly safe even with the most vigorous ones, to attempt to put them on milk substitutes alone within one week after birth; and with calves below the normal in vigor, some milk for two weeks or more may be necessary to raise them. In supplying a substitute for milk an attempt is usually made to use a liquid the composition of which resembles milk as much as possible.

POULTRY AT THE OHIO STATE UNIVERSITY

Factors in Profitable Feeding and Egg Production

RALPH H. STURGEON, '18

FOUR hundred laying hens comprise the flock at the Ohio State University Poultry Plant. Feed and labor are paid for and a good profit turned into the state treasury each day by the eggs laid. Poultry may be made profitable if proper methods of breeding, feeding, and housing are followed, as shown by the university plant.

Colony Houses at the University Plant

Breeding for egg production is a science in itself. Trapnest records must be kept of all the hens to obtain the records of the best producers. Certain external characteristics are correlated with heavy egg production, and these may be used in selecting the best layers. It is not simply enough to know the best laying hen as she may not produce pullets that are good layers. The male birds should have dams and grand dams on both sides that were heavy producers. The hen that has the inherent tendency to lay is going to lay when those that do not have this character will not lay. A hen bred for egg production will not lay unless she has plenty to eat and a warm house.

Feeding is essential but will not make a poor hen profitable or a hen kept in a poor house lay as many eggs as if housed properly. The laying hen must be fed plenty of the right kind of feed. Corn alone is not the right kind of feed, but is good as part of the feed and should be fed morning and night. A dry mash composed of corn meal, bran, middlings, gluten feed, and meat scraps in equal parts should be used. The hen must be kept active or exercising in order that she may digest the large amount of feed she consumes. Milk makes a good addition to any poultry ration, as it takes the place of meat scrap to a large extent. Grit aids in grinding the food and shell furnishes the lime for the egg shells. Green food

should always be supplied as it acts as a regulator and a tonic on the digestive system.

Housing is only another step in making an efficient flock of hens out of the individuals. The house does not necessarily have to be warm but free from drafts. The house with an open front facing the south is suitable as it lets in plenty of sunlight and permits good ventilation. A poultry house should always be dry, sanitary, light and handy. Labor should always be considered in building a house as this is the most expensive item in managing a poultry plant. The more comfortable you can make a hen the more efficient producer she will be. Each hen should be allowed 4 square feet of floor space.

The spring of the year is the natural time of the year for the hens to lay as they get plenty to eat, and the weather is warm and other conditions are favorable. The winter is the time of the year that the conditions are unfavorable for egg production and at this time of the year we try to imitate the spring conditions.

GRADING AND DRAGGING ROADS

JOHN K. GRAHAM, '19

GRADING is the means by which we put the roads in proper shape and dragging is the means of keeping them that way. The drag cannot take the place of the grader, neither can the grader take the place of the drag but both are essential. Many people seem to be under the impression that the drag is the remedy for all ills and takes away the necessity for all further work. This is wrong and unless the road originally has the proper shape the work of the drag is useless. The purpose of the grader is to give the road the proper slope or "crown." This should be about 1 inch to the foot. I have in mind a certain road superintendent who would use the grader only to cut a little off of each edge of the road leaving a hollow place in the middle into which he would throw the sod from the sides. Remember that this trash will not make a road and that the water will not run up hill out of this ditch.

Just as serious a mistake can be made, however, in getting the slope too great. This causes unpleasant riding on either side and hence causes all of the traffic to seek the middle making only one track and again allowing the grass to grow up on the sides. Too steep grading is liable to cause washing so detrimental to any road.

When the road is properly graded, the drag is used to keep the surface smooth and fill the small holes. When dragging, the ground should be mellow and moist but not dry or sticky. It is seldom that all parts of the road will be in the same condition at the same time and some should be left until the last. Dragging should have special attention in the spring of the year. It is well to go over the road once after every rain. The steel drag is good but the plank or split-log type will give just as good results at considerable less expense. By placing a cutting edge of steel on the plank drag it will last practically as long as will the steel one.

MAINTAINING THE FERTILITY OF THE SOIL

E. J. GRENER, '18

THE raising of hogs, the growing of clovers and the use of fertilizers is the secret of success of a farmer in the southwestern part of Franklin county, Ohio. This is accomplished on a farm of 110 acres, 90 acres of which is tillable, the remainder being in woodland and hills. A rotation of corn, wheat or oats, and clover is followed principally, with slight changes as the occasion might demand. No hay, fodder or corn is sold off the farm as such, the only products being sold are hogs and wheat. The farm is composed of soil in the limestone region and is a fairly good soil for corn and wheat, altho most of it is of a clayey nature.

The farm about 15 years ago changed hands and was found to be in a low state of fertility, with the crop yields steadily decreasing. Immediately, better results were noted under its new management. Clover and alfalfa took the place of timothy and a rotation of corn, wheat and clover was used. No more fodder, corn or hay was sold off of the farm as such. Instead, all of this was fed, in addition to some corn, tankage and cottonseed meal that was bought, to a herd of 10 or 12 dairy cows and to hogs. All of the manure was carefully saved and applied back to the soil. This system of management was followed for 10 years, with the result that at the end of this time the crop yields were increased about 75 percent and the farm became a paying proposition.

At the end of these 15 years, which is now 5 years ago, the farm again changed over to new management, under which several changes were made, with better results. The dairy which was found to be the poorest paying business on the farm was disposed of and a corresponding larger number of hogs were kept. Otherwise the farm practices were not changed to any great extent.

At present a rotation of corn, wheat or oats, and clover is followed, or it is sometimes changed to corn, corn, wheat or oats, and clover depending on existing conditions. All of the corn is fed, either being hogged off in the fall or cut and husked in the shock. In case it is cut, wheat is seeded that fall, but if it matures early and if a sufficient number of fattening hogs are on hand, these are turned into it and it is seeded to rye or is left idle. The following spring the rye is plowed under and the field is put back to corn, or in case no rye was sown the field is sown to oats. It is a practice never to put corn in a field for more than two consecutive years. Rye is used as a cover crop during the winter between two crops of corn.

I expect the question is now asked, what is done with the fodder, straw and hay? All the fodder that is cut and not fed to the horses during the winter months is applied to the ground in the spring and plowed under, and allowed to decay to form organic matter. Enough hay is cut for the use of the horses, the rest being left for pasture, which is usually in excess of the needs. If such is the case it is allowed to grow up and is plowed under the following spring to form organic matter. The same is true of the straw, which is not used for barn and bedding purposes. This practice of so disposing of the fodder, hay and straw may appear to be wasteful or it may seem that as if lack of good judgment prevailed.

But under the existing conditions it was found to make the most valuable and the cheapest fertilizer obtainable.

All of the wheat is sold and all corn is fed to the hogs. Usually some corn is bought, and tankage is always used with the corn to form a balanced ration, especially in winter time. In the summer months tankage is seldom used, as it was found that corn and clover together gave a good ration on which the hogs gave their best results.

The only commercial fertilizers used is acid phosphate, applied to the wheat in the fall and to the oats in the spring at the rate of about 200 pounds per acre. This amount of fertilizer together with the plan of farm management followed as mentioned, is found to keep the farm in a high state of fertility with crop yields that are holding their own or increasing, making the farm more profitable under this system of management than it has been at any time for the last 20 years.

DAIRY CATTLE AT THE OHIO STATE UNIVERSITY

L. A. SUTERMEISTER, '18

THE dairy herd at the University is composed of 40 head. Of this number 22 are in milk, 3 are dry and 15 are calves one year old or under. At the present time mostly Jerseys and Holsteins are being milked.

The grain mixture fed to the cows is composed of several different concentrates, to lower the cost and also to secure a more balanced ration. It is made up of 2 parts bran, 1½ parts corn and cob meal, 1½ parts cottonseed meal and 1 part gluten. The Holsteins are fed 1 pound of this mixture for every 3½ pounds of milk produced while the Jerseys and Guernseys are fed a grain ratio of 1 to 3 on account of the higher fat content of their milk. About 5 pounds of alfalfa are fed at nights and all the fodder they will eat in the morning. The amount of silage fed daily varies with the size of the cow, ranging from 25 pounds for the small Jerseys to 35 pounds for the large Holsteins.

A herd sire is kept for the four different breeds. Governor of Keewaydin 17848 is the Guernsey herd bull. He is a large bull showing a good conformation and masculinity. He is getting rather old as he was dropped March 1, 1911. The Holstein bull, Maplecrest DeKol Ogden Boy 172445, was bred by the Maplecrest Stock Farm of Chardon, Ohio. This bull has excellent ancestors and should prove a valuable sire.

The Jersey bull, Miss Welbeck's Raleigh of C. R. 147633, was bred by H. W. Bonnell who owns a prize herd at Youngstown, Ohio. Bonnell has bred several prize winners not only in the show ring but also in production. The Ayrshire bull was recently secured from the Waddington Stock Farm in West Virginia.

At the present time five cows are on official yearly test. Nothing extraordinary in records is expected but the average of the herd is high. In the past the best cow, a Holstein, produced 20,000 pounds of milk and 740 pounds of butterfat. Several other Holsteins have produced 18,000 pounds of milk and 700 pounds of butterfat. The Jerseys have averaged about 12,000 pounds of milk and 550 pounds of fat.

STEEL WATERING TROUGH.

A CONVENIENT watering trough can be constructed out of galvanized sheet iron. A horse enjoys a cold drink as well as man and he can have it by using a light weight galvanized trough that can be emptied instead of a large concrete trough that has no way of emptying but by drinking from it or dipping it out. It also can be easily emptied of water in the winter to prevent it from filling with ice besides being much cheaper to construct than concrete.

We constructed a light trough holding about a barrel of water by using a piece of galvanized sheet iron 3 feet long and 30 inches wide and bending it into a U shape, being about 3 inches narrower at the bottom than at the top. The ends are made of pieces cut 15½ inches wide at the top and 12½ inches wide at the bottom and 11½ inches in height. This is enough to allow for the bending of edges over to make a riveting seam. About ¾ of an inch turned out is enough to rivet securely, placing them about an inch apart. The top edges are stiffened by riveting on L steel ⅛ inch in thickness and 1 inch wide. Large rivets about 6 inches apart are sufficient. A light brace across the center makes a handle that stiffens the whole trough. All end corners should be soldered inside. This trough cost $4 a few years ago.

We used this trough by placing it against the pump house, setting it on wood blocks and holding it in place by a large hook stapled to the building so it would hook under the center brace. In the open it can be conveniently held in place by using large blocks of wood with a U cut in several inches deep for the trough to set in.

R. L. SUNDERLAND, '19.

BREAKING A HALTER PULLER.

A HORSE that pulls and breaks loose from its stall is a disgusting one and may be easily and quickly broken from the bad habit.

A 14 foot rope is doubled, the loop end being placed under the tail, twisting it about twice just over the croup. Each end of the rope is brought forward along the sides of the animal being passed through a surcingle which will secure the side ropes in a firm position. The two ends of this rope are fastened just in front of the chest.

With an additonal 12 foot rope the outfit is complete. This rope is attached at its rear end to the junction point of the other two ropes, while the other end is passed forward through the halter ring and thence around the hitching post.

When the animal pulls backward with this kind of an arrangement, the resultant force is applied directly under the tail and not at the head of the animal. This is painful to the beast, forcing it to jump forward to relieve itself from the predicament.

E. L. SHUCK, '18.

ICE ON THE FARM.

A SUPPLY of ice on the farm during the hot summer months is a luxury that is not found on many farms yet it can be had at a low cost. We have used ice on our farm for so many years that we think we can not get along without it any more and wonder why more farmers do not put it up especially when the cost is so small.

An ice house does not need to be an expensive building. Good storage requires that the ice surface in a house be as small as possible, that it be protected from heat and light, that the house be well drained, and the ice

closely packed. The ice house should be as near square as possible as this will hold the most ice in the least space. The walls should be double and may or may not be packed with sawdust. We find that ice will keep just as well when there is a space between the walls. The water that comes from the melting ice must be carried off by tile drains.

The most important phase concerning ice on the farm is the securing of the ice. Ice may be cut from ponds, lakes or creeks. Ice from any of these sources is good if the water comes from a spring. The farmer should guard against cutting ice from a pond or creek that is contaminated. If a spring flows through a farm the water can be held back in sufficient quantities so that ice can be cut by making an excavation or by damming a ravine. The water ought to be at least 4 feet deep to make easy sawing.

We aim to make the cakes just as large as we can handle conveniently. We usually set the cakes on edge for the first two layers as it does not take so long to pack them, and they can be handled quite easily. The rest of the cakes are laid down flat and packed as close as possible. In placing one layer of cakes over another we place them alternately so that no two cracks come together. We fill the large cracks between the cakes with broken ice, but pay no attention to the small ones. The cakes are placed about 18 inches from the walls. This space is filled with sawdust as the ice is put in and the sawdust must be firmly packed. When the ice is all packed, it is covered with about 15 inches of sawdust. The ice-house needs ventilation the same as any other building. Openings at the gable of the roof provide for this.

On our farm of 160 acres we use about 10 two-horse loads of ice each year but to allow for waste and extra hot weather we put up 12 loads. This is sufficient for cooling 40 gallons of milk throughout the summer, besides supplying the refrigerator in the house all of the time. No one knows the real value of ice on the farm until he has used it. With ice on the farm, the farmer can make all the ice cream that he wants at a low cost. It is of great value in the house for it will keep the meat, butter, milk, vegetables and other foods fresh and healthful.

H. E. WALTON, '19.

A LOADING TRUCK.

A TRUCK for the purpose of loading farm animals into a wagon or box car may be constructed quite easily and yet economically. Yellow pine makes a durable and light truck.

A good length for a rack for this purpose is 12 feet. The bottom is made of 4 planks each 1 foot in width and 1½ inches in thickness. Upon the bottom are nailed securely 12 slats 1 inch by 2 inches and 1 foot apart so the animals will not slip as they walk up the platform.

Three standards 1¾ inches thick, 3½ inches wide and 4 feet in length, on each side, are bolted securely to the base to which are nailed 4 side pieces on either side 5½ inches in width and ¾ inches in thickness, running lengthwise of the rack.

The entire rack is supported 1½ feet above the ground upon a truck which may be automatically taken out or put into place with scarcely any trouble as two vertical irons are placed on either side of the axle, 5 feet of the rack resting on one side of the truck and 7 feet on the other.

This sort of a truck may be easily hitched behind an automobile or buggy and hauled to any desired place.

DOPE—A PERCHERON.

DO futurity winners stop or do they go on?'' The latter is borne out with emphasis in the case of Dope, a pure bred black Percheron mare owned by the University. As a 2-year-old safe in foal, Professor Donald J. Kays, of the department of animal husbandry, gave $800 for her.

Dope is 7 years old and has the fourth foal at foot. She won the Eastern Percheron Futurity the first time the Futurity was shown in 1912. She came back in 1913 as a 2-year-old, being the Reserve Champion American Bred Mare at the fair. Since that time she has never been shown.

She was sired by Diamant, a well known horse that was imported by Dunham's, at Wayne, Illinois, and then purchased by C. M. Jones at Plain City, Ohio. While in the stud for Mr. Jones, Diamant became known as one of the most distinguished Percheron sires in Ohio. His chief fame was attained as a getter of good brood mares, although a good getter of sires. Dope is out of Lois C who was sired by Old Moreau, one of the best horses in northwestern Ohio for several years.

Dope's oldest foal is Ohio's Favorite, a 4-year-old mare. This progeny was sired by Riglon, a horse that has sired more Eastern Futurity winners than any single stallion. Ohio's Favorite shows that remarkable motherly instinct displayed by her mother, in that she has a fine foal at foot at the present.

Dope's second offspring, Ohio's Favorite, is coming 3 years old. She was sired by Velorus, a horse that was shown by George A. Dix of Delaware, Ohio, standing second in the Futurity of 1913. This instance simply serves to illustrate the old axiom of ''The Principles of Breeding'' that ''like begets like'' and the breeder can never expect to get any place by using a poor foundation. Ohio's Favorite also is safe in foal.

The third offspring, Dope's Black Beauty, is coming 2 years old. She was sired by Althazar, the colt that won the Futurity in 1915. Dope's Black Beauty is a big growthy promising filly, and serves well to show that ''brood mare stretch'' displayed by her mother, a thing so much desired by all breeders.

The fourth and last colt is a stallion foal at foot. He was sired by Magic, a horse owned by H. A. Holdridge of Marion, Ohio. This colt shows all the characteristics that one could wish.

It has been said by many that Dope displays all the characteristics of a ''brood-mare true to type'' in a most astonishing degree. And it is a remarkable fact that she has her fourth foal at the age of 7 years, each offspring being a promising beast. Dope incorporates ''the show-ring brood-mare combination to a high degree—a quality found in so few yet desired in many.''

E. L. SHUCK, '18.

GROW YOUR GARDEN SEED.

THERE is nothing of more importance in the growth of garden crops than the use of good clean seed. The seed is mother of the plant and a planting that is half weed seed will not produce vegetables. The world war has been a great disturbing element in the seedsman's business, and the reason for this is that in few enterprises have the civilized nations been bound into a more compact commercial unit than in this. The most practical solution of this problem for the small, as well as for the commercial gardener, is the production of his own seed. Besides insuring himself against a possible shortage, he will also be obtaining a much more uniform

seed and one in harmony with his own ideals.

Ordinary common sense is the best guide as to the methods in collecting and storing seed. Beans and peas are already nearly ripe when ready for use and hence are easily secured. Select a few plants of early maturity and good yield and allow them to ripen thoroly. Then pull them up early in the morning to avoid shattering and hang up until dry. Shell the seed and place it on the floor in a thin layer for a few days to dry out still better. In the case of sweet corn, a single ear is usually sufficient for the entire planting. Select a strong, true-to-variety ear by stripping down the husks and then fastening them back in place with rubber bands until completely ripened on the stalk. The seeds of cucumbers, summer and winter squashes, muskmelons, and watermelons, may be taken from some good fruit that has been allowed to mature. The seed should then be washed free from the meaty part and allowed to dry out on the floor.

The storage of the seed is an important matter. Cloth containers are best for all large seeds and for large quantities of small seeds. For ordinary purposes, however, paper envelopes are best for small seeds. Correct labeling is of paramount importance. Every envelope and container should have on it a label stating the kind and variety of seed, the date, month and year when harvested, and the place where grown. In order to protect against insects it is well to fumigate with carbon bisulfide. A tight barrel is good for this purpose. Place the seed in and put a half cupful of this liquid above it. Allow the seed to remain in here for at least 24 hours. Care must be taken, however, to allow no light or fire of any kind to come near this liquid.

JOHN K. GRAHAM, '19.

CELERY GROWN UNDER SKINNER IRRIGATION.

SPRAYING THE POTATO CROP

How to Treat the Ordinary Diseases of Potatoes

R. L. SUNDERLAND, '19

TO secure the best yield or even a good yield of potatoes it is necessary to spray. It has been estimated that the total loss from potato diseases and insects in the United States frequently is as much as 100,000,000 bushels. The numerous enemies of the potato plant are insects and plant diseases. The main insects are the Colorado potato beetle or the common potato bug, blister beetles, flea beetles, cutworms, and other caterpillars, leafhoppers, plant lice. Of the potato plant diseases the late-blight does the most damage, the early-blight quite a bit and a few other foliage diseases are responsibile for various damages.

Injury by the Colorado beetle is the work of both the "slugs" or young, and the adult beetles. The "slugs" are hatched a short while after the potato is up and commence feeding immediately As they eat the leaves it is an easy matter to destroy them by the free use of arsenates and mechanical devices. The latter is accomplished by jarring the beetles off into a pan containing a little water on which a thin scum of kerosene is floating. Jarring done early in the season is of value for small crops. Egg clusters should also be destroyed in the process of jarring. Arsenate of lead is the best spray, surpassing Paris green in effectiveness and cost. The formula is prepared by using 1 pound of arsenate of lead (powder), 1 pound of soap for "sticker" and 25 gallons of water or Bordeaux mixture. If the paste form of arsenate of lead is used, 2 pounds to 25 gallons is the proper proportion. For small gardens ⅔ ounce, or 10 level teaspoons of the powder to 1 gallon of water is used. Two or three sprayings ordinarily will suffice for the spring generation if applied before the eggs are hatched and about the same number should be employed for the second generation.

Blister beetles are slender, comparatively soft bodied and variously colored. The most common is the black blister beetle which appears about the time of the flowering of the golden rod. It is also known as the "aster" bug. Arsenate of lead applied the same as for the Colorado beetle is the best remedy. Prompt application of remedies at the outset is necessary to save the crop.

Flea beetles attack the leaves of the young potato plants early in the season riddling them with punctures. The larvae of this insect is the cause of "pimply" potatoes, which bring as much as 5 cents less on the bushel. Arsenate of lead and Bordeaux mixture help to keep them in check but an effective remedy remains to be found.

Cutworms do damage to potatoes early in the season, cutting off the young plants near the surface of the ground. The best remedy is to use poison bait. To mix and apply this bait take a bushel of dry bran, add 1 pound of white arsenic or Paris green and mix thoroughly into a mash with 8 gallons of water into which has been stirred 2 quarts of cheap molasses. This amount is sufficient for 4 or 5 acres. After the mash has stood for several hours, scatter it in lumps about the size of a marble near the base of the plants attacked. Care should be taken to keep children, live stock and poultry away from this bait.

Leaf-hoppers are sometimes injurious

to potatoes. The injured leaves have the appearance of having been burned and scalded but the dead leaves show no evidence of early-blight. Leaf-hoppers and plant-lice do not feed upon leaf tissue, but insert their beaks into the tissue and drain the vital juices of the plant, thus weakening them so that a great reduction in the yield of the potatoes results. It is therefore necessary to use a contact insecticide, that is, one that will kill them when it touches them. The standard formula is: ⅜ pint of 40 percent solution of nicotine sulphate, 2 pounds of fish oil or other soap, dissolved, and 50 gallons of water. Paris green and arsenate of lead are absolutely worthless against plant-lice.

Late-blight is the most destructive potato disease. It develops after the blossom period and does its greatest damage toward the end of the growing season. It appears as purplish-black or brownish-black spots on the leaves. The stems are attacked later, and the entire plant may be destroyed in a few days. The blighting of the foliage is followed by the decay of the tubers as a dry rot.

Late-blight is a fungus which lives as a parasite on the potato plant and some of its relatives, notably the tomato. It is spread by wind and water.

Late-blight spores are not found in the soil but it winters in stored tubers. When preparing potatoes for planting reject all that show indications of dry rot. No method of treating seed potatoes to kill late-blight has been found practicable. Thorough spraying with Bordeaux mixture is the only preventive. Also select the best variety for your locality and market, and protect from late-blight by spraying with Bordeaux mixture. It is unwise to dig potatoes when the blight first appears as they are not in as good a condition to keep well as if dug a week or so after the tops are entirely dead. Next sort all potatoes showing any trace of dry rot and store the remainder in a dry place, kept as near 36 degrees Fahrenheit as possible. Dry rot will not develop at this temperature.

Sunscald and tipburn are sometimes confused with late-blight. The former is due to hot weather on young and tender plants, which causes them to wilt and sometimes die. The latter is due to protracted hot and dry weather, complicated by the flea-beetle injury and early blight, which causes the tips and margins of the leaves to turn brown and dry up. The yield of tubers is reduced in proportion to the loss of foliage. Spraying with Bordeaux mixture reduces the injury from tip-burn.

Early-blight is a disease marked by the appearance of nearly black spots on otherwise green leaves. Eventually the leaves yellow and die, and the tuber yield is reduced 10 to 25 percent. The combined treatment advised below includes Bordeaux mixture for early-blight.

The combined treatment: Watch the young plants closely and spray with Bordeaux mitxure and arsenate of lead as soon as the first evidence of the Colorado potato beetle or of flea-beetle is noted. Repeat this application every 10 to 14 days to keep all the new foliage protected. If no insects are present and the weather is dry, the intervals between the sprayings may be lengthened.

As the late-blight season approaches, which in the north usually is after the middle of July, a protective spraying should be given and the weather watched more closely, for if continuous showers occur, with a a mean temperature of 72 to 74 degrees F., spraying every 5 to 7 days will be necessary.

Preparing Bordeaux Mixture.

Bordeaux is the only fungicide that has any practical value against potato diseases. The formula is to use 4 pounds of copper sulphate, 4 pounds of quicklime, and water to make 50 gallons. Prepare the copper sulphate by suspending it in a gunny sack just below the surface of several gallons of water in a clean barrel. When the sulphate is dissolved remove the sack and stir into the barrel enough additional water to make exactly 25 gallons of the copper solution.

Prepare the lime by slacking it slowly in a clean barrel, strain, and add enough water to make exactly 25 gallons. Pour the two ingredients into the sprayer and stir well before using.

HOME LUMBER SUPPLY.

PRACTICALLY every average sized farm in Ohio has a woodlot with a variety of trees which if properly cared for will furnish fuel for the home, all the posts needed on the farm, lumber sufficient to build the necessary farm buildings, and material from which to make other articles found about the farm.

The average woodlot in Ohio contains a variety of trees which will make good lumber. Poplar, cucumber, basswood, and other light wood can be used in making ladders, wagon boxes, hay racks, dump-boards, and other farm articles that require a light strong wood. These materials, however, must be used for things that are to be kept in the dry as they will not endure much moisture and contact with the earth.

The woodlot should furnish all the posts needed on the farm. Of the trees commonly found on an Ohio farm, locust, oak, and chestnut are the best post material. Of these three, the locust is the best and should be used when possible so as to save the oak for a more useful purpose. Oak can be sawed into plank and used for making wagon parts, bob-sleds, and for other articles that need a strong, durable, heavy material.

Hickory material finds a place on every farm. It is best suited for making handles for axes, picks and shovels, and is the best lumber for making axles, double trees and single trees or anything that requires strength.

Both red and white elm are found in most woodlots. Many plank are used on every farm each year and these can be sawed from the elm. Red elm is more durable than white and will serve for other purposes where a light durable wood is required.

The maple is a common tree in Ohio. If there are a large number of hard maple trees in a woodlot they can be used for making syrup. Maple lumber is not durable when exposed to the weather. On the farm it is used mostly for making sled shoes, sled runners, boat runners, and for fence boards.

Ash is not used much by the farmer. It makes good gate boards. It is used to a certain extent for making wagon boxes and handles and is sawed into boards for general use around the farm. Wild cherry is common in most woodlots. It makes a good post and is used for making plank.

Beech is the most common tree in Ohio due probably to the fact that it is of low value and has been left standing after the other trees were cut. It is one of the best woods for fuel and is generally utilized on the farm for this purpose. Beech lumber is very hard and will keep well if absolutely out of contact with moisture and with the earth. For this reason it makes a good lumber for building the frames of farm buildings.

Every farmer should know just what material is in his woodlot and for what purpose it will serve best on the farm. There is usually a saw-mill nearby which will saw the logs into all sizes of lumber. If the farm woodlot is cared for and the material properly utilized, the farmer will not need to buy much lumber to use on his farm.

H. E. WALTON, '19.

PAINT IS PROFITABLE.

THE liberal use of paint on the farm will pay a big interest on the money invested and the labor employed. That a coat of paint applied to a wagon will double if not treble its value is shown time and again at auction sales. You will see two wagons of practically the same age and make put up to sell and the one recently painted sell for over twice as much as the other. Many farmers never paint their machinery. They either do not know how to paint them, or else they think that it does not pay to buy paint.

Buildings and tools all over the country are badly in need of paint. Paint is not a luxury but is really a necessity. It is more useful for protection than for ornament. It will also keep buildings more sanitary.

Any man can paint his buildings and do a serviceable job and the equipment necessary is small. A farmer should have a variety of paints and brushes among the supplies in his shop. Paint will not deteriorate much in cans and it is convenient to have on hand. Linseed oil should be used freely about the farm and it will pay to buy it by the barrel. White lead and linseed oil probably make the most durable paint and should be used on all good buildings. The cheaper paints, however, are good enough for cheaper buildings and machinery. There are a great variety of pigments on the market so the farmer can color his paint to suit his own taste.

The only equipment for painting that the farmer needs to buy is brushes. Several brushes ought to be used as different things will be painted. The round brush does better work and gets the oil worked into the wood better than does a flat brush. The flat brush will spread the paint faster and is the best brush for varnishing. The small oval brush is best for painting window sashes. Much white washing needs to be done in the stables about the farm and a flat brush 8 or 9 inches wide is best for applying the whitewash. Before machinery is painted it must be thoroughly cleaned and the rust removed. A steel wire brush will serve the best for this purpose. The paint will dry much faster if a few drops of drier is mixed with the paint. By adding varnish to the paint the machine will show quite a luster when painted. Before painting buildings, the boards should be scraped and cleaned. A piece of sheet iron will serve as a scraper, and an old kitchen knife can be used for a putty knife. Two coats of paint can be applied within two weeks time. It is best, however, to paint oftener and apply but one coat at a time.

The best time to paint machinery is on rainy days during the period just after it is being stored for the season. It should first be repaired, and then cleaned and painted. Red lead is the best kind of paint to use on machinery as it has a tendency to prevent rusting, and by adding a pigment it will give a variety of colors. A more general use of paint by the farmers will increase the value of their buildings and machinery, and they will not have to buy so much high priced machinery.

H. E. WALTON, '19.

BENEFITS OF SOY BEANS.

RAISE more soybeans and help win the war and meet the high cost of living. Soybeans have been found to be useful as a source of human food as well as animal food. Analysis shows that they contain nearly three times as much digestible protein as wheat but they have only about three-fourths as much digestible carbohydrates. By mixing corn with soybeans you can obtain a food which will analyze about the same as does wheat. By using soybeans as a substitute for wheat the people of the United States would be able to save many thousand barrels of flour.

Soybeans can be grown on all types of soils that are well drained, properly inoculated, and reasonably well supplied with available potash and phosphoric acid.

They should be planted 2 or 3 weeks later than corn. The best place in a crop rotation would be following the corn crop. The seed bed should be warm, loose, level, free from clods, and firm below, with the surface two-inches fine and mellow. It can be prepared the same as the seed bed for corn or oats.

There are various methods of planting soybeans but probably the best one is the use of the common grain drill. By covering a part of the feed valves of the grain drill one is enabled to plant the beans at any desired width.

The same methods of cultivation given corn will do for soybeans. They should always be given a shallow cultivation, and this should preferably be done during the heat of the day, because at this time the plants are less brittle and will be less injured by the cultivating implement.

An Attractive Farm House Entrance

There are several methods of harvesting soybeans but probably the best one for the farmers of Ohio is the use of the mowing machine. The mower should be provided with a side-delivery attachment fastened to the rear of the cutter-bar. Its function is to deliver the cut grain to the rear of the mower frame in a windrow where it will be out of the way of the team and the machine while making the next round. Farmers owning a self-rake will find it valuable in gathering this crop.

The grain can be thrashed with the common grain separator by running it at a lower rate and by removing some of the concaves. This prevents the cracking or splitting of so many beans.

L. N. GEIGER, '18.

CARE OF THE WOODLOT.

THE medium sized farm usually has a woodlot covering several acres of land, and there is no one thing on the farm that is so neglected. Probably the reason is due to the fact that in the past a forest was rather an expense to the farm and a thing to be destroyed to make room for the crops; hence the neglect that has been given it. It is an eyesore to see woodlots all over the country in such a neglected state.

If properly cared for a woodlot will return a profit to the farm, as will any crop. Fuel has become so high in price during the past years that a profit can be made in cutting and selling stove wood. If the woodlot is to prove valuable to the farm it must be fenced off from the main pasture as cattle and horses are detrimental to young trees. The woodlot needs weeding every year as does any crop. In weeding a woodlot, first the dead trees are removed and then the ones which show evidence of decay. Such trees are detrimental to the woodlot as they harbor insects and diseases which are likely to be transmitted to the strong, growing trees. If there is more time to give to the woodlot a cutting of all undesirable trees is made. These trees include undesirable varieties, crooked trees, diseased trees, and all young growth of a foreign nature. All this material can be used for stove wood. When the large trees cease making a rapid growth they can be cut and marketed. All lumber is high now and will bring a good price. Any spot in the woodlot which is bare should be set out to quick growing trees. Catalpa and osage make a remarkably quick growth and in a few years will be ready for posts. If the woodlot is fenced off the young trees will grow straight and tall; so that as the old trees are removed the new ones will take their place and there will be no need to set out new trees. Weeds and grass will do no harm in the woodlot as they never make a vigorous growth and they tend to catch the leaves and hold the moisture.

During the winter is the best time to cut out the weed trees and market the wood and lumber but at that time it is difficult to tell which trees should be removed. The farmer ought to market the trees during the summer which he thinks should be removed. They can then be cut some time during the winter. A well-cared-for woodlot is an asset to any farm, while on the other hand a neglected woodlot is a liability and should not be allowed to exist.

H. E. WALTON, '19.

MAKING BRICK CHEESE.

BRICK cheese can be made economically on the farm by curdling fresh whole milk with rennet. The morning and evening milk may be mixed together if 12 gallons of milk are not received at one milking. One hundred pounds or 12 gallons of milk are put into a boiler or tub and set on the stove or heated to 86 or 90 degrees. The milk is then removed from the stove. One tablet of rennet is used to every 12 gallons of milk. The tablet is placed in a glass of warm water and dissolved. Pour the contents of glass into the milk and stir for 5 minutes. Leave the milk set until the curd becomes firm. Place the finger into the curd, then raise upward, if no curd remains on the finger it is ready

to cut. The curd may be cut by means of a curd knife, bread toaster or be broken with a curd rake or milk stirrer. It should be cut into ¾ to 1 inch cubes.

After the curd is cut it is slowly heated up to 100 or 110 degrees. The container can be placed on the back of the stove or better still in another vessel of warm water. In order to get all of the curd heated to the required temperature, it must be stirred. This is one of the most important steps in making cheese. Stir the curd once every 5 minutes to prevent the curd from settling to the bottom of the vessel. If stirred too much it will break the curd into fine particles, which will cause a loss of curd and butterfat.

When enough whey has been removed the curd will be rubbery when pressed in the hand. The curd is removed from the whey and placed in a clean sugar sack. Place the sack in a flat pan which has holes in the bottom so that the whey can drain away. A board should be placed on the top of the cheese and weighted with a brick.

At the end of 24 hours the cheese should be removed from the pan and salted; this is done by rubbing the salt on the outside of the cheese, leaving all the salt that will cling to the damp cloth.

The cheese is placed in a room with a temperature of about 60 degrees to cure. Salt and turn the cheese once each day for the first 4 or 5 days, after which the cheese should be turned every other day. In 6 or 8 weeks the cheese will be ready to eat. From 9 to 14 pounds of brick cheese may be gotten from 100 pounds of milk, depending upon the percent of butterfat and the aomunt of moisture left in the cheese.

H. D. F. PINKLEY, '19.

A SUCCESSFUL HYDRAULIC RAM.

A PROPERLY installed ram is one of the best and at the same time one of the cheapest methods of furnishing water on the farm. One of the most successful installations that I had opportunity of seeing was on the farm of J. S. Monroe in Green county, Ohio. The spring came to the surface about half way up a gentle slope and a containing basin about 3 feet square was made at this point. This was of concrete with a cover over the top to keep out the trash. The essential thing in every case is to have a constant supply which can not become sufficiently roiled to permit silt or sand to enter the supply pipe. From the containing basin a pipe carried the water to the base of the ram. The ram was sunk in a concrete pit 7 feet deep and 5 feet wide with the walls 5 inches thick. Of course the length of the supply pipe will be regulated by the height to which the water is to be lifted while the size will be regulated by the amount of water and the size of the ram. From the pit the surplus water was tiled a distance of about 50 rods into a gravelly subsoil, the only outlet that could be found. This worked satisfactorily.

Sufficient head was acquired to raise the water a height of 15 feet where it emptied into a tank in the attic in the farm house, but by a turn of the handle the water could be diverted into a cement cooling trough in the milk house. As the house stood on a small hill, the overflow water from the cooling trough was led by a pipe to a large concrete watering trough near the barn. By this method a continual supply of fresh water was furnished.

C. H. SPRAGUE, '19.

THE FIRE PROTECTION PROBLEM

R. L. SUNDERLAND, '19

WHAT protection have you from being wiped out by fire? In 1914 property loss to the amount of $10,766,-651 was paid out by mutual fire insurance companies in the United States. These companies insured only rural property. This amount would not cover the entire loss of those buildings that were insured besides there was a large loss of buildings which were not insured. This loss was due to defective flues, dilapidated and weather beaten shingle roofs, want of lightning protection on buildings and fences, soot accumulations in chimneys, careless disposition of ashes, rubbish accumulations in garrets or elsewhere, the use of the so-called parlor match, and the careless use of kerosene, gasoline, and other inflammable substances.

How can these conditions be improved? In the first place buildings should be more carefully constructed? If this were done it would eliminate a large percent of the fires from defective flues. Dilapidated and weather beaten roofs make an ideal place for sparks from the chimney or from the passing threshing engine to lodge. A new roof would pay good interest on the investment for the fire protection it affords.

The lack of lightning protection on buildings and fences is a rather serious cause. Rods may seem to be expensive to put on a medium value building. A suggestion to overcome this objection is to use a grade of rod according to the value of the building or its contents. Cheap rods are not usually as effective as more expensive ones but they afford a good degree of protection. Some claim that rods draw lightning. This may be true to a slight extent. A violent stroke of lightning which otherwise would come near to a conductor would likely be diverted to it and pass to the ground harmlessly. Otherwise the stroke might cause damage. A building that is protected by rods has the advantage of lower insurance rates which is enough of itself to put rodding a building on a plane of good investments.

Fires from soot accumulations in flues are absolutely unnecessary. Dirty flues can be overcome by glazing the inside surface as this does not permit the soot to collect. All chimneys should be cleaned once a year if for no other reason than to improve the draft, besides the fire protection it affords. Sooty flues can be effectively cleaned by tying a round iron to a long rope and pulling it up and down allowing it to scrape the sides of the flue. If a fire does result from a defective flue an effective means of extinguishing it is to throw several handfuls of salt down the chimney.

The ways of prevention of fires from careless disposition of ashes, from rubbish accumulations in garrets or elsewhere, from the use of the parlor match, and the careless use of kerosene, gasoline and other inflammable substances are obvious.

There should be some effective means of combating fire in case it does break out. If a fire is noticed in time chemical extinguishers are effective, especially if a fire breaks out in inflammable fluids or substances. Every farm should have a good set of at least 28-foot ladders. If you can get to the base of a flame, it can be combated more effectively. A good water supply is a credit to any farm and an essential for the best of fire protection.

New York state has an excellent system of rural fire protection by the cooperation of the village and rural communities. This state has a fire district law under which, on a petition signed by a number of voters, the authorities can set off any stated section of the country named in the petition as a fire district and the voters in this district can elect fire commissioners, issue bonds and purchase fire equipment to be located in the center of the district for the protection of the whole district. Other states are adopting similar measures. This protection consists of a Ford truck with up-to-date chemical equipment and a pumping outfit sufficient to handle any fire in rural districts. Insurance as a protection against loss by fire is of much importance, but insurance will not replace the loss of inconveniences or actual money.

ADVERTISING MILK PRODUCTS

C. H. SPRAGUE, '19

AS the prices of milk products increase their consumption decreases; such is the condition today. That such a condition exists is due to a lack of knowledge of the food value of milk, butter and cheese. In many of the large cities where the price of milk has advanced from 1 to 3 cents a quart, the consumption has materially decreased which would ordinarily result in an over-production if large amounts of condensed milk were not being shipped abroad. If the food value of milk products was universally understood, the demand would cause an increase in price that would be in a fair ratio to the food value. At the same time the producer would receive a correspondingly better figure for his product and the dairy industry would receive a stimulus.

How are the people to be educated about the real value of milk products? Why not follow the plan of the citrus growers of California and thru a national organization launch an advertising campaign? By bringing the different breed associations together, the foundation for a strong organization could be laid. I think the plan of D. D. Aitken, president of the Holstein-Friesan Association, a good one as far it goes, that of obtaining money for publicity by taxing each producer a certain annual fee for each cow. I believe that the creameries should also contribute to this common advertising fund as they would be benefited by increased prices and production.

Never before was so much oleomargarine sold as during the past season due primarily to the high cost of butter and the common belief that the one is as good as the other. They may be of equal food value as far as the energy they produce is concerned but oleomargarine lacks entirely growth-producing and disease-resisting properties that butter contains as shown by recent investigations. How many mothers would feed their children oleomargarine if they were aware of the fact that it was incapable of producing growth? Yet the deluding advertisements of the oleomargarine manufacturers lead them to believe that oleo is a butter "substitute." The dairy industry is paying dearly for their silence. Advertisements calling the attention of these people to the true merits of butter would have a lasting influence on the dairy industry.

Most people think of milk the same as they think of coffee, an adjunct to the meal, but if they understood that it is one of the most nourishing foods they would increase their daily allowance. By comparing milk with other food products, its true value as an economical food is brought forth. In comparing foods it is necessary to consider both the protein and energy furnished as neither one alone can be used as a basis of comparison. The following table compiled by specialists of the Department of Agriculture shows the quantities of various foods needed to supply as much protein or energy as one quart of milk:

Protein

One quart of milk is equal to—
7 ounces of sirloin steak
6 ounces of round steak
4.3 eggs
8.6 ounces of fowl

Energy

One quart of milk is equal to—
11 ounces of sirloin steak
12 ounces of round steak
8½ eggs
10.7 ounces of fowl.

Another method of comparison is shown by the table below, in which the relative value of certain food as economical sources of protein is given—

	Is as Cheap as	
Milk at	Sirloin Steak at	Or Eggs at
7c a qt.	16.3c a lb.	17.6c a doz.
8c a qt.	18.6c a lb.	20.1c a doz.
9c a qt.	21.0c a lb.	22.6c a doz.
10c a qt.	23.3c a lb.	25.1c a doz.
12c a qt.	27.9c a lb.	30.2c a doz.
15c a qt.	34.9c a lb.	37.7c a doz.

With milk at 15 cents a quart it is a cheap source of energy as compared with sirloin steak and eggs. It is also one of the most easily digested foods.

Cheese is another milk product whose food value is not appreciated by the majority of people. American Cheddar or "store" cheese is generally well liked but there is an impression that it is indigestible and constipating. Experiments carried on by the Department of Agriculture show that 95 percent of the protein of cheese is digested and 90 percent of its energy available. One man who ate cheese as the chief source of protein and energy, eating an average of 9.27 ounces daily with bread and fruit for more than two years did a fair amount of muscular work and kept in good health. Publicity work on this food showing its food value would undoubtedly cause a large increase in consumption. How many people appreciate the fact that one pound of American Cheddar cheese contains as much protein as: 1.57 pounds of sirloin steak, 1.35 pounds of round steak, 1.89 pounds of fowl, 1.79 pounds of smoked ham, 1.81 pounds of fresh ham, and as much energy as: 1.98 pounds of sirloin steak, 2.61 pounds of round steak, 2.52 pounds of fowl, 1.17 pounds of smoked ham, or 1.29 pounds of fresh ham.

It will be seen that a pound of cheese supplies more than twice as much energy as a pound of fowl or round steak and almost twice as much protein as the same amount of fowl or ham.

TRACTOR TEST ON THE UNIVERSITY FARM

JAMES A. HOWENSTINE, '19

IN an attempt to secure some actual evidence on the operation of tractors in the field, a test has recently been run on the University farm. A 12-20 horsepower tractor was used, pulling a three-bottom gang and harrow. Students in advanced agricultural engineering performed the test.

The field plowed was formerly used as a truck patch. Part of it was in timothy sod, a part was covered with old potato and tomato vines and a part had beeu fall plowed, so that the whole field was anything but favorable for an ideal test. The soil was of a heavy black clay with patches of sand and gravel at places. There were some grades in the field having a rise of 2 to 15 feet per 100 feet horizontal distance. The soil was in proper condition in regard to moisture. A depth of 8 inches was maintained as near as possible thruout the test.

The field was trapezoidal in shape and was plowed in lands leaving a strip 40 feet wide around the field so that the field could be finished with a minimum of unplowed land in the corners.

The tractor performed exceptionally good at all times. The grades in the field were plowed with ease, the tractor having plenty of reserve power. At no time was it necessary to raise the plows in order to allow the tractor to go ahead. The tractor was easy to guide, the right front wheel running in the furrow making steering practically automatic. The plowing was done on low speed or at 1.66 miles per hour. Due to the special hitch designed for the harrow, the gang could not be pulled at the regular plowing speed. The field was left in almost perfect condition for a seed bed as the harrow effectively broke up the furrow as it was turned over. It was noted that the soil was lightly packed in the lower portions of the field.

The lands were finished and the headlands plowed off without experiencing

Machine in Action

any trouble. The last round was plowed 30 inches from the fence, and by means of the power plow lift the corners were plowed as completely as could be done with a team of horses and a walking plow.

The motor worked exceptionally good on kerosene, and no knocking or pounding was observed at any time, showing that the kerosene was properly carbureted and that water was not required to prevent pre-ignition when ordinary

outside temperatures prevailed. The cooling system used about 1 quart of water per day.

Data.

Acres plowed, 14.6.

Total time in field, 26 hours,, 24 minutes.

Time lost turning at ends, 2 hours, 26 minutes.

Time lost in field, adj. trouble, etc., 1 hour, 49 minutes.

Actual plowing time, 22 hours, 9 minutes.

Time spent in oiling and greasing, 6 hours, 10 minutes.

Percentage or time lost at ends, 9.21.

Percentage of time lost in adj. tr., 6.88.

Average rate in miles per hour, 1.66.

Acres plowed per hour, .401.

Fuel and Oil Data.

Kerosene consumed, 361.8 pounds at 12 cents per gal.....	$6.512
Lubricating oil, 4 gal., at 80 cents per gal.....	3.20
Hard grease 1 pound at 15 cents	.15
Gasoline 2 gal. at 25 cents.....	.50
	$10.362
Gallons of kerosene per acre.....	3.71
Cost per acre plowed and harrowed	.709

It will be seen from the data that the total cost is 70.9 cents per acre. The cost of lubrication is high due to the fact that new oil was put in at the beginning of the test and drawn out at the finish. This oil could have been used for more plowing if desired. The gasoline was used for starting and priming.

SUMMER FIRE WOOD.

THE lack of coal does not need to affect the farmer during the summer, for much material is found on every farm that will make good summer fire-wood. Summer fire-wood should burn readily, make a flashy fire, and die down quickly. Old rails, posts, timbers, and dead trees make the best kind of summer wood.

Many farmers cut their stove wood from the green and hard varieties and leave the softer trees; thus we find an abundance of this soft material left in the woods to decay. This is because the trees of soft texture saw hard and do not make as much heat. These varieties include bass-wood, poplar, sycamore, soft maple, and black ash. If this wood is worked up in the winter and becomes thoroughly dry it will make excellent summer wood. These trees will cut easy if a sharp saw is used which has an extra amount of set.

Much summer wood can be worked up out of an old orchard. Old orchards that need more or less trimming are common on most farms and many of the limbs are large enough to make into fire-wood. A buzz-saw is a good thing to use in sawing limbs and rails. A four-horse-power oil or gas engine will furnish power enough to saw limbs and rails and much can be sawed in a day.

If a farmer will save his green and hard trees for winter wood and use the inferior wood of his woodlot for summer, he will be provided with good fuel the entire year that is superior to coal and it will be much cheaper. The time it takes the farmer to clean up his farm of old wood will pay him big returns for the improvement to his farm,and he will have a supply of summer wood free.

H. E. WALTON, '19.

ORCHARD COVER CROPS.

COVER crops are an agricultural asset the importance of which is greatly underestimated by the farmer orchardist. They prevent loss of fertility from winter washing, add to the humus content and so to the water holding capacity when they are turned under, they decrease loss from winter killing by causing the early ripening of the wood, and the advantage of not having to contend with mud is an important one at fruit-picking time.

According to the Michigan Agricultural Station it is because trees and vines grow most from budding time to midsummer that it is well to keep clean cultivation up to that time. The chief exception to this rule is the case of old apple trees where a sod mulch the year around keeps growth slow and induces a heavier setting of fruit. A too rapid growth at the time the fruit buds for next year are set is not conducive to a heavy crop.

So the opportunity for the use of cover crops may be said to depend upon the system of cultivation followed. When the sod mulch is used it forms a permanent cover crop, but if the fruit lends itself to clean cultivation as do peaches and grapes a cover crop may be used in either of two ways: First, to be disked into the ground in the spring, or second, to be plowed under in the spring.

For the first, with the exception of rye, it will be easier to disk in a crop which has been winter killed, as oats and Canada peas, oats alone, barley or buckwheat. The latter is exceedingly good because it will catch under the most adverse conditions as to preparation of seed bed, drought, or poor soil and quickly make a big growth to supply humus and catch dead leaves. While these plants and rye are not nitrogen gatherers they do supply lots of humus and to a certain extent prevent washing.

If spring plowing can be practiced it is much better to use a nitrogen gathering plant. Most of these which have proven successful do not winter kill. One of the best is hairy vetch. It is generally sown with rye because it does not make a big growth early in the fall. But it is easy to get a good stand and the plant is not killed by the tramping of pickers and pruners. It is hardy and can be drilled 15 to 18 pounds per acre with a bushel of rye or oats.

Mammoth clover is good but is less sure than vetch. It requires a good seed bed and plenty of moisture to do well. This clover, however, is better adapted to a clay soil than is vetch. Sow 20 pounds to the acre. At the same time we have seen many excellent stands of vetch on rank clay soil.

A cover crop is particularly valuable to the fruit grover as he seldom has enough manure. Having 12 tons of green manure to the acre spread ready to turn under, grown with no loss to his fruit is a boon not to be lightly overlooked.

GORDON DIXON, '18.

DIPPING SHEEP.

We keep our flock of sheep free from ticks by a simple method of dipping, which involves little labor and expense. The first dipping is about July 1st and subsequently every three weeks.

We use a galvanized dipping tank, made especially for that purpose. This can be built so that it will act for a good many years. We dug a place in the ground just so the tank would fit in nicely, built a raised approach to this tank so that the animal will have to walk up a cleated incline and then immediately over a sharp ridge on a

smooth decline that ends by letting the animal slip into the tank. A cleated board slatting, is placed in the other end of the tank to aid the sheep in crawling out. They go into a small tin lined crate to drain off the surplus disinfectant and save a loss.

Any common ordinary dip for this purpose is used, diluted 5-95 for most solutions. The lambs are kept free from all the injurious insects and pests that ordinarily infect the body of a sheep. The same dip is use time after time, if enough more of the solution is added occasionally, in order to keep the strength sufficient for proper results.

BREAKING A KICKER.

After experiencing considerable difficulty with kicking horses I have found the following method a satisfactory remedy in most cases: Fasten two pulleys to the shafts at about the place where the kick-straps would ordinarily go; take about 12 feet of a ½-inch rope and run thru the pulleys so that the loop end is over the horse's rump; take the ends forward and fasten to a strong check-rein. Every time the horse tries to kick he will jerk his head back. This is better than the use of the ordinary kick-straps in that it not only prevents kicking but also provides a punishment for the horse.

ERADICATING WILD ONIONS.

Fortunate is the farmer who can say, "My farm is free from wild onions." This weed is one to be much detested especially when found mixed thru the wheat field. The bulb being so near the same weight and size of the wheat kernel is very difficult to separate from the wheat. The damage it inflicts upon wheat is due to the onion flavor given to the flour and the trouble caused by the rolls in the mills. If cattle eat it the milk or butter as well as the flesh of beef is tainted.

Success in destroying the wild onion has been obtained by spraying the infested field with orchard heating oil between April 15 and May 1. This is best applied with a power pump on a warm day, spraying it in a fine mist Best results are obtained by leaving the oil on the surface of the ground for 2 weeks after applying. Efficient work requires about 75 gallons per acre. One application may not entirely destroy them in which case a second application is advisable.

MINERAL SUPPLEMENT FOR HOGS.

Did you ever have one of your fat hogs break down just before you sent him to market, or just before you butchered him? Considerable trouble of this sort has been experienced and the cause is a lack of mineral matter in the feed. Feeds which have enough of the other food nutrients, protein and carbohydrates, are ordinarily considered as having sufficient mineral matter also, but since hogs do not eat any considerable amounts of roughage their skeletons are likely to be weakened because of a lack of minerals. This is especially true in the winter when the hogs cannot get at the grass and when they are fed corn alone.

The following mixture is recommended to correct this deficiency: Charcoal, 1 bushel; hardwood ashes, 1 bushel; salt, 8 pounds; air-slaked lime, 4 pounds; sulphur, 2 pounds; and pulverized copperas, 2 pounds. Mix the salt, lime, charcoal, ashes, and sulphur thoroly; dissolve the copperas in water and sprinkle it over the mixture. Feed this in a self-feeder or put it in a box and place before the hogs at all times.

OF
OHIO STATE UNIVERSITY
A MEDIUM FOR EXCHANGE OF IDEAS BETWEEN COLLEGE AND FARM

Published by the Students in the College of Agriculture. Established 1894.
Subscription Price, One Dollar the Year
Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

STAFF

V. G. APPLEGATE, '18, Editor-in-Chief.

Assistants to the Editor:

G. F. Henning, '19
S. G. Price, '19 G. F. Johnson '19

M. V. BAILEY, '18, Business Manager.

W. L. HAMMOND, '18, Circulation Manager.

Assistants to the Business Manager:

C. H. Sprague, '19 O. J. Smith, '19

COLUMBUS, OHIO, MAY, 1918.

EDITORIAL

THE ISSUE.

This is an ideal issue from at least one point of view. Since the beginning of year we have encouraged students in the college of agriculture to contribute articles for this paper. Now the ideal has been reached and we have one issue which has been written entirely by students.

This work has been done largely by those students who are taking the course in Agricultural Journalism and is an expression of the work being done in that department. Most of the articles are shorter than the usual type but they are written largely from personal experience and contain many valuable suggestions.

It is hoped that this issue may influence and encourage other students to write articles for later issues and thus make the paper more truly a product of the college of agriculture. What do you think of the idea and the ideal?

THE BACON HOG.

At last the bacon hog is having his inning, Uncle Sam has created a large market in his demand for bacon to feed his soldiers. As the only hog meat used in the army is bacon, the heavy, well finished hog is bringing a lower price than the light hog, on the market. The last few weeks at Chicago the general prevalence has been that the more fat a hog carried the less attention the buyers paid to it. While the army demands bacon the people are demanding light loins, both of these qualities are found in the bacon hog. No doubt breeders of these hogs are making the best of these conditions as a stimulus to increase production. While the raising of bacon hogs can never become

general in the cornbelt states nevertheless this phase of farming will be given considerable thought in the next few years in those sections where suitable feeds for their growth can be produced.

OUR NEW TIME.

Will the national change in time benefit the farmer? Will it give him longer working hours or an opportunity to work longer if he so desires? Congress has enacted this law for the main purpose of increasing food production. For the city man it will have the desired effect as it allows him an extra hour of daylight when he returns from his office or factory. But the farmer works from daylight which is usually his alarm clock until around a certain time at night. The time at which one stops work naturally varies with the amount and kind of work that must be done but most farmers try to finish their work for the evening outside of the chores at a definite time. A farmer is going to work only so long unless it is a matter of saving his hay or some equally important matter.

With the new time schedule, the time of daylight will come one hour later than before. If the farmer follows the daylight schedule he must also work an hour later at night to do the same amount of work as he did previously. Unless the farmer rises in the morning when it is dark, to start his day's work the change of time will not give them a greater amount of daylight. Beginning about August 1st it does not grow light in the morning until about 5 A. M., with the change of time this would make it 6 A. M. Now the question is, are the farmers going to get up at 5 A. M. eastern time and work in the dark for one hour. There is no doubt that this change in time greatly helps the city man who naturally loses several hours of daylight before he gets up but it is doubtful whether it affects the farmer any.

CULTIVATE CORN EARLY.

Every farmer is going to raise as much corn this summer as he can; if he knew how he would raise still more. But there is one thing that interferes with the production of maximum crops and it has been observed so often that it needs no proof—a maximum crop of corn can not be grown without a minimum crop of weeds.

It is not wise to leave the planted corn field untouched during the 2 to 4 weeks that may be required for the grain to sprout and be large enough for the use of the regular cultivator. The first cultivation should begin in a few days after planting and should be repeated weekly until the corn is large enough for the ordinary cultivation.

This can be done with either the spike-tooth harrow or the weeder, the choice depending upon the condition of the ground. Many of the little weeds or sprouted seeds will be torn out and destroyed if the work is done on a warm sunshiny day. Altho some of the corn may be destroyed the results will be profitable in the end.

COLLEGE ACTIVITIES.

Upperclassmen notice a great change in the activities about the campus in the last year. This was caused, in some cases, by a lack of coal but the drafting and enlisting of students has made the execution of activities an uncertain affair.

The University Grange has met only a few times on account of the lack of coal; the Saddle and Sirloin Club has recently been reorganized; no agricultural open night was held; the Horse Show is only a memory and many other

activities have given away to something concerned with winning the war.

Liberty bonds are being sold; benefit dances are given; war savings stamps are bought; and win-the-war parades are fashionable. Indeed, Ohio State is giving the best she has in materials, in ideas, and in men to place freedom and liberty in the hearts and lives of all people.

WHERE ARE THE YOUNG PEOPLE?

Those who make a study of rural conditions invariably find that the number of young people in the country is decreasing. Of course the total number of people in the country is decreasing but not as rapidly in proportion as the young people.

At the present time this is more noticeable on account of the war but it had been serious before 26 per cent of the men in the draft had been taken from the farms. Since the death rate in the country is not much higher than in the city, it is evident that there is either a shift in population or a decrease in the birth rate.

The first accounts for a great part of the change. The last several years have seen the departure of many young people from the farm to go into the cities but few have come from the cities to the farms. There is also a larger falling off in the birth rate in the country than in the cities. Whatever the causes may be, these changes are certain to have social and economic effects upon the rural districts which are becoming more evident as time passes. These changes will develop problems which must be solved by each separate community and the communities will then be able to adjust themselves to the new economic and social status.

PLANNING THE GARDEN.

Nearly every farm house has its accompanying garden plot where vegetables are raised to supply the table during the summer and to store for winter use, but often the farm garden is not made to produce its possibilities. Many times one crop is harvested and then the ground remains idle for the remainder of the season when it should be growing a crop of later variety.

Early potatoes may be followed by turnips; lettuce and radishes can be harvested before the time to plant late cabbage; peas and sweet corn may occupy the same space in a single season; onions will be used before time to set out celery and so the list might be increased until nearly every section of the garden could be made to produce two crops or more in a single season.

Besides being a profitable and economical method of production, it also necessitates continual clean cultivation. This keeps weeds down and tends to improve the tilth of the soil. When soil is treated in this way it must be heavily fertilized or manured and the organic matter should be maintained by the use of cover crops such as rye or clovers.

Home Economics Department

USING THE CASSEROLE

The housewife can practice economy by using a casserole. The time required for cooking is about twice as long as the ordinary way but the finished product has a better flavor, is more digestible, and more tender.

When cooking vegetables enough liquid should be added so as to have a continual simmering. The low even temperature obtained by using the casserole makes the fibers and cellulose more tender and more digestible; also the flavor is better for the reason that the volatile flavoring oils are not boiled down to a greater strength. The vegetables should be seasoned with salt, pepper, and any other seasoning desired and the same amount of butter or other fat added which would be used in the other way of preparing vegetables. Onions, cabbage, cauliflower and Brussel sprouts may be successfully cooked in this way and the odors which go thru the house by the other way of cooking are kept in the casserole.

Apples, prunes, apricots, dried peaches and other fruits stewed in the casserole are more evenly cooked, remain whole while cooking and have the flavor of the fresh fruit.

The casserole is used mostly for the preparation of meats. It is especially valuable for the low-priced cuts of meats. The time required for cooking meat this way is from 2 to 3 hours. Before placing the meat in the baking dish, it should be browned evenly in a hot pan with a little fat but do not use butter for it burns too easily. Then place the meat in the casserole and add the stock and any desired vegetables as flavoring. Cover the dish tightly and place in the oven. When it is necessary to use the oven in which the casserole has been placed for anything which requires a higher temperature, set it in a pan of hot water and keep it at the proper temperature by adding cold water at different intervals. Keeping the heat steady and moderate is the secret of successful casserole dishes.

Left-over dishes prepared in this baking dish will not have the flavor which is present in fixing left-over dishes the other way. The time used for preparing and cooking them should be doubled because of using only the steady and moderate heat.

After taking the casserole from the oven let the chilling be gradual, if it is subject to sudden changes of temperature such as from the hot oven to the wet sink it will soon be ruined by cracking. When a casserole is purchased it should be filled with cold water and slowly brought to boiling, then letting it gradually cool. If sudden changes of temperature are avoided the baking dish will last for many years. If it is necessary to prepare the dish on top of the gas stove, do not allow the flame to flare up around the casserole. It should always be placed upon an asbestos mat when heated on the top of the stove.

RUTH CHRISTEN, '19.

MEAT EXTENDERS.

IN these war times when we must conserve our meat supply as much as possible one of the best ways is to prepare different cuts of meat properly and to use meat extenders and substitutes. Large quantities of meat are consumed in the United States—about 170 pounds per person per year. This is largely due to the fact that we have had an abundant supply and it is relatively cheap. It is a nourishing food and has a very desirable flavor. Now conditions have changed and we must conserve meat, which will benefit many people as too much meat is eaten. A diet consisting largely of meat will cause the body to become saturated with acid and general body processes will be disturbed.

The problem is to make tough meat tender and to keep tender meat tender. Meat is cooked to make it palatable and appetizing, also as a sterilizing process. Tough meat has long muscle fibers and a large amount of connective tissue. It is best ground, pounded or scraped. Moist heat for a long time dissolves out the connective tissue which is a gelatine like substance. A better flavor is obtained if the meat is first seared and then subjected to moist heat, the browning closes the pores thus preserving the juices. In making soup the meat should be cut into small pieces and cooked in cold water. It should be cooked slowly in order to get out the flavor and juices. The scum which arises to the top of the soup is protein a valuable tissue builder and if skimmed off the soup will lose its nourishing value. It will only have a stimulating effect and this is an extravagance.

Tender cuts of meat have short muscle fibers and little connective tissue. They should always be seared well first, then the temperature lowered. Tender meat should never be cooked long or it will become toughened.

Other foods which can be made to take the place of meat in the diet are fish, cereals and milk, and cheese. Meat extenders may be made use of by using a little meat and plenty of vegetables.

MARY R. WERNER, '18.

NEW BOOKS FOR THE COUNTRY HOME.

One of the great problems of a person living in the country is the proper selection of books for entertaining as well as for information. It is not always possible for the farm people to obtain lists of the latest books published and if possible maybe not convenient. All rural citizens as well as those of the city are interested in the present day problems and in order that we may wander away frequently from the gruesome tales of war and lose ourselves in something not so earthly, but of a romantic type, some present writers have produced good fiction which has been based upon the world war, but it is lighter literature to read than that classified as war information. We must always remember that we have good, medium, poor and bad literature. If one book is not satisfactory, then the thing to do is to select something better for the next time. Now I have written down a small list of the typical fiction of today and also the latest war books published with the names of their authors and the price of each book. One can purchase these books at most any good book store.

Fiction.

		Price
1.	"Making Her His Wife," Corra Harris	$1.30
2.	"The Holy City," Selma Lagerböf	1.50
3.	"The Making of George Groton," Bruce Barton	1.40

4. "The Little Red School House in the Hollow," Amanda Hall 1.35
5. "The Apple-Tree Girl," George Weston 1.00
6. "Vicky Van," Carolyn Wells 1.35
7. "The Pawns Count," E. Oppenheim 1.50
8. "The White Morning," Gertrude Atherton 1.00
9. "The Tree of Heaven," May Lindair 1.60
10. "Boy Woodburn," Alfred Ollivant .. 1.40
11. "The Restless Sex," Robert Chambers 1.50
12. "The Way Out," Emerson Hough 1.50
13. "The Air-Man and the Tramp," Jenneth Lu ..... .75
14. "His Daughter," Governeur Morris 1.35
15. "Oh, Money! Money!" Eleanor Porter 1.50
16. "Where the Souls of Men are Calling," Harris 1.35

War Books.

1. "In the Heart of German Intrigue," Vaka $2.00
2. "Warfare of Today," Lieut. Col. Azan 2.50
3. "Life in a Tank,' Capt. Hugh 1.25
4. "The Only Possible Peace," Dr. Howe 1.25
5. "American Women and the World War," Clarke 2.00
6. "Blown in By the Draft," Frazier Hunt 1.25
7. "The Glory of the Trenches," Lieut. Dawson 1.00
8. "The Cradle of the War," Woods .. 2.50
9. "Outwitting the Hun," Lieut. O'Brien 1.50
10. "Great Britain at War," Jeffrey Farnol 1.25
11. "At the Front in a Flivver," W. G. Stevenson
12. "Over the Top," Arth. Guy Empey 1.50

BOYS' AND GIRLS' CLUB WORK IN OHIO

L. N. GEIGER, '18

THE boys' and girls' club work for the coming season is progressing rapidly over the state with a total enrollment of approximately 500 to date.

Organization work was planned to begin in February but owing to bad weather only two counties were visited for organization work. These were Union and Shelby, whose work is well under way. Organizers have recently been working in Cuyahoga, Clermont, Auglaize, Lake, Summit, Miami, Van Wert, Tuscarawas, Crawford, Brown, Putnam, and Ross counties.

The clubs constituting this work are home making clubs (both food and clothing clubs), pig, poultry, stock judging, corn, potato, garden, and garden and canning clubs. Seven new counties have asked for the work this year. That is, these counties have never had organized club work conducted within their boundaries.

A new feature of the work this year is the conferences of the club leaders of the different counties. Three counties have held such conferences at which a representative from the Boys' and Girls' Club Work Department of the Agricultural Extension Service of the Ohio State University discussed these subjects; development and history of the club work, the club meeting, the local leader, and opportunities and responsibilities of the same.

Many inquiries are being received from over the state asking about the club work and the interest is better than it has ever been.

TEN GREAT DUROC BOARS

W. A. HARPER, '20

THE great sire has achieved that greatness by transmitting the ability to produce uniformly good qualities in his offspring. A sire may be great by reason of inheritance or he may be great due to show ring record or the records of his progeny but it requires the sum total of these to make him really great.

Going back to the early history and development of the breed, we find three distinct blood lines: Protection, Col., and Orion. The Protection line was named after Protection, a hog that was bred and shown by Mr. S. E. Morton, of Camden, Ohio. Protection's record in the show ring and as the sire of 8 noted boars made him illustrious. The most noted was Ohio Chief, credited with 14 widely-known sons.

High Chief and The Professor are selected as Ohio Chief's best get. High Chief sired Cherry Chief. Cherry King, sired by Cherry Chief, transmitted to Orion Cherry King the qualities of his ancestors that have made the breed famous and the Orion Cherry King family the most popular of the breed.

Orion Cherry King was bred and developed by Ira Jackson of Tippecanoe City, Ohio. It was in the herd of Mr. Jackson that Orion Cherry King made his wonderful record as a sire and established the popularity of the family. It is safe to say that 75 percent of the honors awarded at the principal shows are captured by this family and 50 percent of the herd boars are likewise of this family. Orion Cherry King is considered a representative of the Protection family but we find in his breeding the blood of Col. M. and of Orion. It has become a common practice to mingle the blood of the three great lines and the results are gratifying. Most of the winners of late have been produced this way. At present no individuals are selling higher than those of

Protection breeding (Orion Cherry King) and the Orion (Joe Orion 11) combined in their pedigree.

It gives almost as much pleasure to trace the Orion family thru its stages of development. This line begins with Orion and the first great Orion boar was Orion Chief. Orion 2nd was brought to Ohio from the west and developed by Mr. Morton. Orion 2nd was used in the herd of Mr. Morton but later was sold to Ira Jackson. It was in Mr. Jackson's herd that Orion Chief was bred and developed. Orion Chief was sold to Mr. Thomas Johnson of Oakland Stock Farm. It was while on this farm that Orion Chief contributed so largely to the development of the breed. Joe Orion 2nd is the best present day representative of Orion Chief qualities and the Orion blood lines. The same assertion may be made regarding the breeding of Joe Orion 2nd as was made of Orion Cherry King—blending of the blood of Orion, Protection and Col. lines.

This is clearly shown in their pedigrees given below:

ORION CHERRY KING 42475
- Cherry King 25979
  - Cherry Chief 21335
  - Stylish Perfection 3rd 59436
- Orion Lady A 39756
  - Orion Chief 13333
  - King Lady 30782

JOE ORION 2d 35527
- Joe Orion 23833
  - Orion Chief 13333
  - Buceye Princess 41860
- Cherry King Lady 71034
  - Cherry Chief 21335
  - Stylish Perfection 3rd 59436

The Enochs Farm, Fernwood, Mississippi, lately purchased this great sire of champions for $5000, the highest price yet reached in this breed. This price appears ever more phenomenal when we learn that Joe Orion 2nd is in his eighth year. His remarkable vigor, strong body, and sureness as a breeder, coupled with the quality of his produce, enabled Joe Orion 2nd to sell for such a mark. Recognition should be made of Top Notcher, sired by Oron 2nd. The Top Notcher family is an important one and a good number of the prominent hogs of the past belong to it.

The last one of the three families is the Col. line. The first Col. sire was Col. M. He also may be traced to the Morton herd. The King of Cols. is conceded to be the greatest sire of this line having 12 noted sons to his credit. The King of Cols. was sired by the Prince of Cols., he by Carl's Col., by Ed's Col., by Walt's Top Col., by Col. M. The best known sons of the King of Cols. are King of Cols. 2nd, Defender, Premier Col., Top Col. and King, the Col.

The King of Cols. 2nd sired Fancy Col., the sire of 9 noted sons, chief of which is Imperator, now at the head of the Mayfield herd at Lexington, Ky. Premier Col. sired Pal's Col. and Volunteer, two great boars in their time. Top Col. sired Morton's Top Col., claimed by Mr. Morton to be one of the two best sires he ever owned. Morton's Top Col. sired American Top Col. and Taxpayer. Taxpayer sired Taxpayer's Model, Mortgage Lifter, and Model Taxpayer. Defender has been credited with 18 worthy sons. The Defender blood may be found in purest form and greatest amount in the herd of McKee Bros., Versailles, Ky.

Ohio Chief, Orion Chief, King of Cols., The Professor, Cherry King, Orion Cherry King, Fancy Col., Top Notcher, Walt's Top Col., and Joe Orion 2nd thus constitute, in my opinion, the 10 greatest sires of the breed.

DIFFERENT USES FOR THE POWER SPRAYER

GORDON DIXON, '18

ONE of the important articles of equipment on Sunnyside Farm, Lorain county, Ohio, is a power sprayer. The specifications for this machine state that it carries 200 gallons of spray solution which is applied at 150 to 200 pounds pressure by a 3½ H. P. gasoline engine. This outfit is of interest to us on two counts: how it has been doing this work effectively for 4 years, and the many incidental uses to which it has been adapted.

The farm has been run for 15 years in accord with the teachings of modern agriculture. Situated in a once prosperous grape region it is one of the few farms which fought successfully the numerous diseases and insects that attacked the grapes some 15 years ago. It was upon the advice of the Ohio Experiment Station that peach growing was first tried out and Sunnyside became a pioneer in the profitable cultivation of that fruit. Now each year sees new orchards added to the many thousand trees already extending along this section of Lake Erie. It is no uncommon sight in spraying time to see 4 or 5 vehicles in the spacious yard at Sunnyside while their owners take lessons in the latest ways of mixing the various sprays, insecticide and fungicide, or follow the machine in the orchard and vineyard observing the thoroness of the work, diseased branches, or methods of pruning.

Along side of the barn and protected by dirt thrown out by excavating the 12 foot barn cellar is a huge cistern 14 feet in diameter and with a capacity of some 1400 gallons, which catches the water from the barn roof. The sprayer has been sucking up its own water from this cistern for 4 years.

There is a fruit packing house about 24 by 30 feet and on the first floor, which it at just the level of a wagon-bed, a shaft and countershaft having been rigged to the ceiling To this is attached the cream separator, corn sheller, grindstone, sausage grinder and the clothes washing machine with power wringer, for the principle of labor conservation is applied to the house work as well as to the farm work. On Monday mornings unless actually engaged in spraying or the weather is too cold the sprayer is brought up alongside the packing house, the engine disconnected from the spray pump and the agitator by simply loosening one nut and slipping out the key—and a belt run in thru the door. This door is the same one thru which the sprayer itself, which weighs above 1200 pounds, is rolled every winter and completely overhauled, painted inside and out and all worn or bad-acting parts ordered new from the factory. For this is not a strictly ideal machine, by any means, only a hard-working-the-year-around sprayer and parts do become bad-acting.

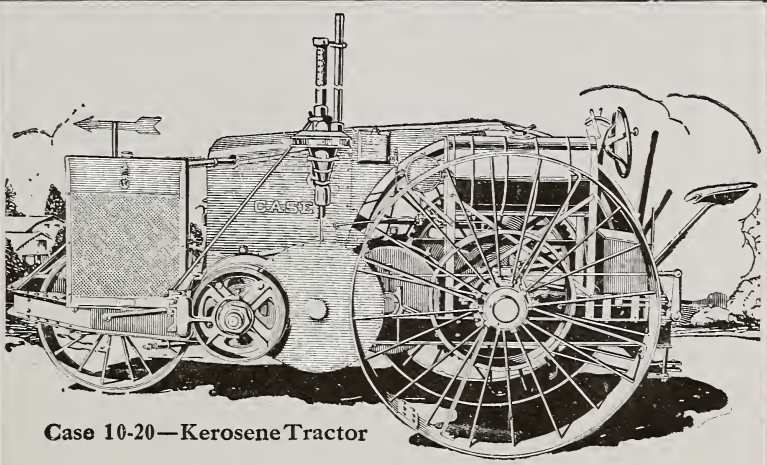
As most of the farm is in fruit all fodder must be conserved. On the barn floor is a shredder placed near the door so that corn fodder can be unloaded conveniently close when hauled from the field during the winter, and so that the sprayer can be hauled up alongside the door and "belted up."

As an engine for pumping water the sprayer has done good work. Enuf old spray hoses have accumulated about the place to form a pipe line across to

Founded 1842

CASE

Famous the World Over



Case 10-20—Kerosene Tractor

Most Economical Most Dependable

That is the reputation gained by Case Kerosene Tractors. The official tests made by the Agricultural Engineering Department of the University of Nebraska gave startling proofs of these Case advantages.

The hundreds of tests made by farmers as well, confirm this expert testimony.

Case Tractors are made by a concern which has been in the agricultural machinery business for 76 years. Case has been working on gas tractors for 26 years, so today's Case Kerosene Tractors are not experiments. All the experimenting has been done beforehand so that purchasers buy tested tractors.

Each Case Tractor is built to conform with those same standards which have won Case such great fame in the mechanical world. They are built not only to perform their duty, but to stand up through hard usage and to do their work at a minimum cost.

No agricultural student is thoroughly informed of oil tractors until he has read the Case Tractor Catalog. A copy will be sent free upon application.

J. I. CASE THRESHING MACHINE CO., Inc.
(Founded 1842)
1078 Erie Street, Racine, Wis.

Send for this Descriptive Printed Matter—All Free

Below are listed the different series of booklets and folders. Tell us which interest you.

FREE Books

Kerosene Tractors
Steam Tractors
Grand Detour Plows
Threshers
Hay Balers
Silo Fillers
Road Machinery
Automobiles

Or, if you wish, ask for our General Catalog, describing the entire Case line. It is free.

Write Today

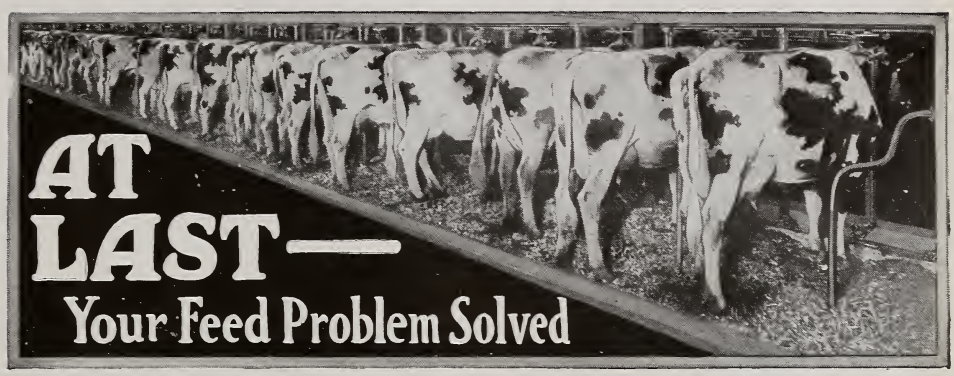
the flower beds in the front yard and even the rose garden at the far side. In the drought of August—and the drought is none the less severe for having the broad expanse of Lake Erie stretching from just below the orchard to as far as the eye can reach—when the lawn is burned brown the spray engine is cut off from the solution and pressure tanks and it throws a 20 or 30 foot stream from the nozzle. In practice this has been limited by the soundness of the hose rather than the power of the engine.

It is not known just how long ago the hired men discovered that this pumping capacity could be used in place of the old arm-strong method of pumping for the cows, but when the machine is driven into the yard for the night it invariably happens to have been left set close up to the cistern which supplies the cattle.

One year, in order to get water for spraying, it was found necessary to dig a well in the beach and let it fill with sand so that with sand points and a small engine water could be forced to the top of the cliff 30 feet above. The hole had to be blasted down thru solid shale and after each blast the pieces thrown out and the sides straightened up with picks. But water kept filling up the whole so that it would have been impossible to get far had someone not thot of keeping it pumped out with the sprayer. The well was sunk about 10 feet deep and tapered from nearly 12 feet in diameter at the top to 3 or 4 at the bottom.

Each spring it has fallen to the lot of the farm boy to make 15 or 20 bushels of alfalfa chop for the chick brooder house floor and mammoth hover. It had been observed that he was never enthusiastic about his job as it required several hours laborious turning of a small clover cutter crank. The first spring that the sprayer was on the farm he had it rigged with a belt to the fly wheel of the clover cutter and seemed to be really enjoying the job.

In the way of farm equipment we at Sunnyside have come to believe that nothing exceeds the power sprayer in all-around utility, while the wealth of labor saving devices that can be built up around it makes the machine a real factor in efficient management.



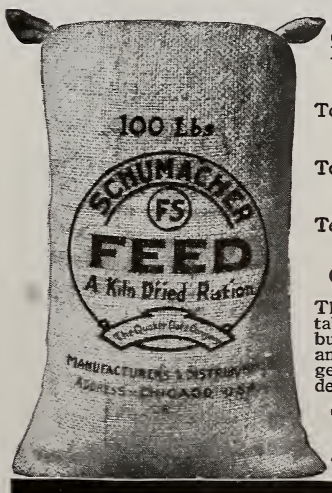
You Can Feed Any Cow the Right Feed to Meet Her Individual Need

Dairy farmers and breeders have been urging us for sometime to give them an ideal high protein mixture to be used with SCHUMACHER—the old reliable carbohydrate feed. They wanted a feed that would better meet the INDIVIDUAL NEEDS of their cows—a feed with as great a variety of protein content as we have variety of carbohydrates in SCHUMACHER FEED.

We have produced the feed that fills this requirement—a remarkable high protein feed—BIG "Q" DAIRY RATION—as much superior to other protein feeds as SCHUMACHER FEED is superior as a carbohydrate feed. With

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

fed in combination you can easily and quickly proportion the amount of protein and carbohydrate content to suit the requirement of every cow. Try these suggestions and let your cows render the verdict:



General Herd Ration with Ensilage or Roots:
1 part Schumacher Feed.
1 part Big "Q" Dairy Ration.

To Fresh Cows with Green Feed:
2 parts Schumacher Feed.
1 part Big "Q" Dairy Ration.

To Dry Cows:
4 parts Schumacher Feed.
1 part Big "Q" Dairy Ration.

Test Ration:
1 part Schumacher Feed.
2 parts Big "Q" Dairy Ration.
(Increase Big "Q" Ration if cow can handle more protein without bad effects.)

This combination feed has unusual palatability, digestibility, variety, nutrition and bulk. It results in greater milk production and improves to a wonderful degree the general health of your herd. At your dealer's—if he can't supply you, write us.

THE QUAKER OATS CO.
Address: Chicago, U. S. A.

HORSE TALK IN WAR TIME

WILLIAM C. SKELLEY, '18

IF the adage "In time of peace prepare for war," which has never been more forcibly exemplified than at the present time by the totally unprepared condition of the United States in the great world war, be true, to my mind under existing conditions the opposite of this adage should be equally true, and in time of war prepare for the peace that is to follow by preparing for the great demand there will be for draft horses.

The breeding industry in England, France and Belgium is today in a deplorable condition, and if the war continues for any great length of time, will be entirely a thing of the past; consequently the United States should be prepared to meet this crisis when the proper time comes. Instead of the United States importing her pure bred stock from France, Belgium and England she will be shipping abroad her home bred horses to rebuild this great industry in these devastated countries.

The war has depleted the number of horses in the United States and the demand for years to come by all the Allied Nations will be such that unless we increase our breeding double to what it now is we will be unable to supply our foreign trade. After the war not only will France, England and Belgium look to the United States as the horse market of the world, but Japan will also join in this industry and it would not be surprising to see her in a few years one of the leading draft horse countries of the world.

It behooves every man engaged in agriculture to go about this problem in a scientific manner. The large breeding establishments of this country will follow along the same high grade policy

E. S. ALBAUGH
Manufacturing Jeweler
TWENTY-TWO EAST GAY STREET

The Jewelry Shop
FRATERNITY & CLASS PINS
LODGE EMBLEMS.
Automatic Phone 8017

HENNICK'S CONFECTIONERY
The one place around the campus where you can get good things to eat and drink.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

NEW $3 HATS

You can be sure of quality when you buy one of our hats; full value for every dollar you invest—the same high standard today as heretofore.

THE H. K. SMITH CO.

Eleventh and High **Fifth and High**

IF YOU HAVE YOUR PHOTO MADE BY

THE OLD RELIABLE Baker Art Gallery **STATE & HIGH STS.**

COLUMBUS, O.

IT WILL ALWAYS BE BETTER.

Our photos are the most durable. We excel in the large variety of Exclusive Styles and Artistic Finish.

SPECIAL RATES TO ALL UNIVERSITY STUDENTS.

that has already made their horses famous, but the small breeder should select two or three pure bred mares of the highest type and breed to the best stallion obtainable and in this way the standard will be raised to a marked degree of perfection. Competition will be unusually active, and the small breeder will have just as good a chance as the larger both in the sale of his young horses and also in the futurities for draft colts.

As America has responded so nobly during this great world conflict both with men and money, in the reconstruction period which is to follow she will be looked upon as a leader, so let us not falter in this great breeding enterprise and make a second mistake of being unprepared.

W. W. Ellenwood, '15, is managing an orchard at Croton, Ohio.

CARE OF THE COLT.

Proper care of the colt should begin as soon as it is born, and cleanliness is one of the main essentials. When the colt is born and the afterbirth of the mare has come away, if a second box stall is available the mare and colt should be removed to this, which has been prepared with plenty of good bedding that there may be no danger of any dirt or filth coming in contact with the naval cord.

A strong colt will be on its feet and trying to nurse in less than an hour after birth. Such a foal needs no help, but a weak one will often have to be held up to suck until it gains strength. Before the foal is allowed to suck the first time the mare's udder should be washed with luke warm water using some disinfectant, which will keep the udder free from all infected matter.

At birth the intestines of the foal con-

Get the "Spirit of the Times"

ECONOMIZE—SAVE

Have your light summer clothing

DRY CLEANED
REPAIRED or
ALTERED

to present styles. The result will surprise you.

The Lehman Co.

1666 N. High St., Columbus, O.

Gent's Furnishings
Notions
Jewelry

tain a sticky mass of fecal matter. This should come away promptly and in case it does not, insert either a small tallow dip candle or a piece of castile soap shaved down to a point at one end so that it can be easily inserted in the rectum, which will nearly always bring the desired results. Constipation is the main thing to be guarded against, and if no trouble of this kind arises during the first week, the colt is in a fair way to begin rapid growth. When the colt is a month old it will begin to nibble at grain. Oatmeal and bran is the best combination at this age and a little later change to oats and bran. If foals are cared for in this manner during the summer months the weaning process is an easy one, and the colt will not be harmed by the change.

REPAIRING FARM BUILDINGS.

THERE is nothing which adds more to the appearance and value of a farm than well kept and properly arranged buildings. About 20 years ago when father bought the first few acres of the present homestead, many people said, "What do you want with that place, you will have to tear down about half of the old buildings to repair the others?" but the reverse has been true. There are now two more buildings on the farm than there were then and but one has been torn down. This was one of the old barns, whose timbers

BLACKWOOD, GREEN & CO.
HARDWARE

Furnaces, Stoves and Kitchen Furnishing Goods

Slate and Metal Roofing
Auto Repairing

624 N. HIGH ST. COLUMBUS, O.

MARGARET NADDY-TURKOPP of the . . **Emerson Academy of Dancing**

HIGH AND WARREN

extends to the students of Ohio State University and their friends a most cordial invitation to attend the Friday evening dancing parties given for their pleasure and to enjoy the teachings of this select school.

Start in with a class now and get the benefit of class work so as to learn the art of dancing before the spring dances. All finished dancers come from the classes.

CLASS NIGHTS.

Beginners—Tuesday and Thursday, 7:30 P. M.

Advanced Class—Monday and Wednesday, 7:30 P. M.

Assembly Dance—Orchestra music every Friday and Saturday, 8:15 P. M.

Private Lessons by appointment.

TUITION—Class Lessons, 10 for $5; Private Lessons, 6 for $5.

Information given cheerfully by phone.

Citizens 11958; Bell, N. 8682; Bell, N. 5902.

were so heavy and short that they could not be used in the newly-planned barn.

The first thing to be done was to re-roof the stock barn. Later a new building was erected to house the farm scales which were in a narrow "cooped-up" affair on the end of the horse barn. The scales were then moved to the new building. Two years later a new barn 36 by 60 by 20 feet was built. This covered no more ground than did the old one, which was torn down, but its capacity was increased so as to obtain at least four times the service from it.

By this time the stock barn was rapidly gaining a shabby appearance, so the next summer it was re-sided. A new poultry house was also built during the same summer. About three years later both the carriage-house and granary and the corn crib were remodeled.

By this time the house, which was by far the best building on the place when purchased, had become a disgrace to the homestead. So a few years ago it was remodeled, rearranged, and equipped with a furnace.

By this remodeling of buildings together with fencing and tiling the appearance of the farm has been improved considerably and the homestead has an increased value.

But simply remodeling is not all that is required to keep farm buildings in repair. They need paint. Our buildings are painted about every 4 or 5 years. This of course necessitates some painting each year that the expense of painting and the time required for painting could be equalized over that period of time. Much of this work, especially the painting has been done by members of the family. This keeps the expense at a minimum, as this was usually done when the farm work was not rushing.

L. N. GEIGER, '18.

VOCATIONAL AGRICULTURE IN OHIO

L. N. GEIGER, '18

MANY rural communities are now realizing the value of a practical education for the future farmer. As a result of this realization together with the stimulus of the Smith-Hughes Act a number of rural high schools of Ohio have decided to add vocational agriculture to their curricula.

The Smith-Hughes Act was passed by the United States Congress and approved by President Wilson in February, 1917. The act is three-fold in that it provides funds for the teaching of agriculture, the teaching of trade and industrial subjects, and the training of teachers for the teaching of such subjects. Ohio has met the requirements of this act and has received the approval of the federal authorities.

The fact that this act serves as an incentive to the boys of the rural high schools is shown by the eagerness with which these schools want to come under the law. Last February nineteen high schools were organized and are now giving a course in vocational agriculture to their boys. These schools have an average enrollment of 25. There are numerous requests from different schools from all sections of the state that they may become a Smith-Hughes School. There is no doubt that there will be a larger number of such schools established next summer and fall. Thereby more boys will be permitted to proceed on a vocational course of study.

As this is the first year for such instructions the work offered consists largely of farm crops, vegetable gardening and dairying. In some of the schools where 3 or 4 years' work in agriculture was offered previous to the Smith-Hughes Act animal husbandry, soils and some of the more advanced subjects are being taught.

The pupils selecting the vocational agricultural course must also carry out a home project under the supervision of the agriculture teacher. These projects have been selected for the coming summer; the plans for conducting them are well laid; and the projects are now in good progress. The nature of the projects vary somewhat in their scope. These projects must be based upon the knowledge which the boys have obtained from the present year's school work. Therefore, the majority of the projects consist of growing a farm crop. Many of the boys concluded to grow 5 to 10 acres of corn as their project; others, ½ to 1 acre of potatoes.

In gardening regions several of the

Marzetti Restaurant
1548 NORTH HIGH STREET
WE BAKE OUR OWN PIES
SHORT ORDERS OUR SPECIALTY

PROF. W. J. RADER'S
Private Academies of Dancing

NEIL AVE. ACADEMY
647 Neil Ave. Phones: Citz. 4431; M. 6189.

Dance Correctly.

Spring Term—Beginners' Class organizes Friday evening, May 10, 7:30 o'clock. First lesson.
Advance class Monday evening.
Reception Night Thursday evening.
Reception Night Saturday evening (front hall).

NEIL AVE. PAVILION
Open Tuesday, Friday and Saturday evenings.

OAK STREET ACADEMY
827 Oak St.
Citz. Phone 4431; Res. Phones: Citz. 4431; M. 6189
A strictly private place for Club Dances and Private Classes that organize for special instructions.

TUITION:

Gentlemen, per term of 10 lessons	$5.00
Ladies, per term of 10 lessons	5.00
Private lessons, $1.00; six for	5.00

Tuition can be paid $1.00 per week until paid.
Private lessons can be had afternoon or evenings.
The Waltz, Two-Step and the late modern dances taught in one term.

Decoration Day and Commencement Day
ARE NOT FAR AWAY

You begin to take up the real issues of life. You have acquired knowledge that you will put to practical use.

The value of being well dressed becomes apparent to you. Have your clothes hand-tailored, cut to your individual measure.

Here on display is an assortment of fabrics that will make clothes that will contribute toward your success.

As a suggestion, come here and see our beautiful line of Serges, Unfinished Worsteds and Worsted Cheviots that will make a beautiful suit for this occasion, and give you an abundance of wear throughout the season.

Bradley, The "So-Different" Tailor
1541-3 NORTH HIGH ST. CITIZENS 16796

Highest Winning Butter Is Colored
THE RICH GOLDEN JUNE SHADE

—BY—

Chr. Hansen's Danish Butter Color

The Color that does not affect the Finest Flavor or Aroma of first-class butter.

Chr. Hansen's Laboratory, Inc., are also headquarters for:

Rennet Extract and Pepsin substitutes for same, Rennet Tablets and Cheese Color Tablets, Liquid Cheese Color, Lactic Ferment Culture, etc.

Chr. Hansen's Laboratory, Inc.
LITTLE FALLS, N. Y.
Western Office, Milwaukee, Wis.

FOR SALE
Three Unit Sharples Mechanical Milker

In excellent condition. Selling because owner is quitting dairy business. This milker has always given complete satisfaction. Address Agricultural Student, Box B, Ohio State University, Columbus, Ohio.

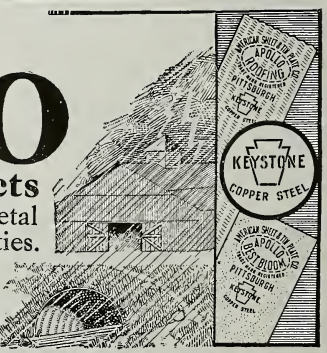
boys have selected a commercial gardening proposition as their project; in this case a quarter of an acre is usually recommended by the teacher as a good-sized project.

As a number of girls were pursuing the one-year general agricultural course when these schools took up vocational agriculture they were permitted to take a course in vegetable gardening. In these cases the girls have selected a small home garden as their project. A few of the boys have selected such projects as farm accounts, farm management, and a poultry project but such projects are as yet in the minimum.

The object of the home project is to unite the field trip, laboratory, and book knowledge and apply them to practical farm work. This certainly is an inspiration to the boy to become a good farmer.

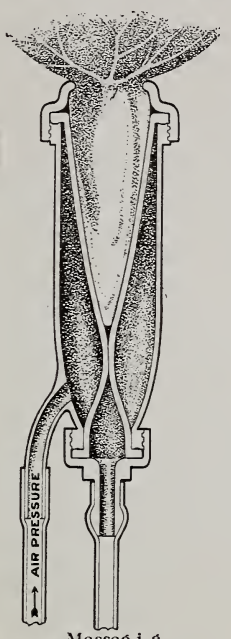
There are now nineteen schools in Ohio carrying out such work in their agricultural department. These schools are located at the following places: Hebron, Medina, Hillsboro, Marion, Wadsworth, Painesville, Paulding, Valley City, Fayette, Bellefontaine, Berlin Heights, Prairie Depot, New Bremen, Wooster, Versailles, Plattsburg, Millersburg, Gibsonburg, and Worthington. The schools at Wadsworth, Prairie Depot, Marion, and Plattsburg are township high schools. The one at

Apollo
Lightning proof—
Weather proof—
Roofing Products
For lasting service and fire protection use metal roofing—adapted to rural and city properties.
APOLLO-KEYSTONE Galvanized Sheets are carefully manufactured and highest in quality. Unequaled for Roofing, Siding, Culverts, Silos, and general sheet metal work. Sold by leading dealers. For fine residences and public buildings KEYSTONE COPPER STEEL Roofing Tin Plates are unexcelled. Look for the Keystone added below regular brands. Send for our "Better Buildings" booklet.
AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.



Please mention THE AGRICULTURAL STUDENT when writing advertisers.

Flexible as the Human Hand



Massag i g

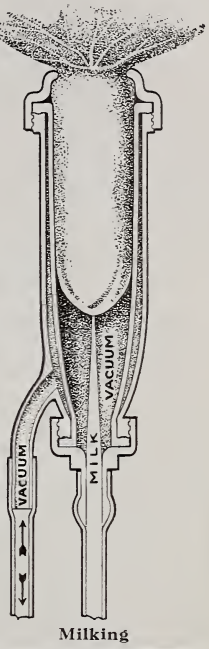
The UNIVERSAL MILKING MACHINE differs from all others in that the inner lining of the teat cup (pure, seamless rubber) expands and contracts with each stroke of the pulsator, squeezing and massaging TWO TEATS ALTERNATELY, exactly like hand milking.

This massage is always from the bottom of the teat up, precisely like the action of a calf's tongue when it stops sucking to swallow. The action of

THE UNIVERSAL MILKING MACHINE
TRADE MARK REGISTERED

is so natural and so gentle that there is no possibility of injury. You owe it to yourself to write for our literature.

The UNIVERSAL Milking Machine Co.
216 WEST MOUND ST., COLUMBUS, O.



Milking

Worthington is a teachers' training school.

The time has come when we must know how to get the most from the soil without robbing it. Therefore the future farmer must have a more scientific knowledge of farming that he may be successful. The population of the country and the demands for food stuffs are now asking that the farmers produce larger crops. These demands will not decrease, but instead will increase as time passes. I believe that the Smith-Hughes law will provide the opportunity or incentive for the farm boy to become a more successful farmer; and with such a hope as this many of the country boys will enter the agricultural colleges because people realize that the successful farmer of the future will be the educated farmer.

L. N. GEIGER, '18.

LICE ON CALVES.

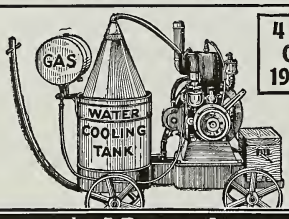
Calves infested with lice do not thrive well. Therefore the calf- grower should make frequent examinations to make sure that lice are not present on the calves or in the barn. If lice are discovered an effort should be made to get rid of them. This may be done by thoroughly cleaning the barn and disinfecting it by thoroughly spraying with a 5 per cent solution of coal tar dip. The calves should be washed with a solution of coal tar disinfectant ranging in strength from 3 to 5 per cent. If this is done in cold weather the calves should be rubbed with dry cloths and kept blanketed until dry to prevent them from catching cold. Crude oil may be used instead of coal tar disinfectant by carefully and thoroughly rubbing it over every portion of the body.

The Cedars Herd
Improved Large Yorkshires

W. H. FISHER, Proprietor.
Farm One Mile East of Powell Station, H. V. Ry.
Office, Columbus, 50 East Broad St.
Correspondence solicited.

For Potato Bugs And Blight *use*
SULFOCIDE
and
CAL-ARSENATE

—a new combination which bids fair to replace the old Lime Sul hur-Arsenate of Lead and Bordeaux-Lead mixtures, in both orchard and garden.
It is more powerful and much less expensive. 1 gallon and 4½ lbs. makes 150 gallons of spray.
Send for circular
B. G. PRATT CO., *Mfg. Chemists*
50 Church St. Dept. 50 New York



4 H. P. Only 190 lbs.

Easy to Move Around

Get a Cushman

The Light Weight, **All-Purpose, Farm Engine**—that one man can easily move around from job to job. May be **attached to moving machines,** such as grain and corn binders, corn pickers, potato diggers, hay balers, etc.—besides doing all regular jobs. **Very Steady and quiet**—no loud explosions or jerky fast-and-slow speeds. Weigh only about one-fourth as much as other engines—4 H. P. only 190 lbs.; 8 H. P. only 320 lbs. Sizes up to 20 H. P. No matter what size you need, **get the All-Purpose Cushman.** It is cheap in the long run. Ask you dealer to show it. Book free.

CUSHMAN MOTOR WORKS
926 North 21st Street, Lincoln, Neb.

These treatments will not kill the eggs that may be present so that the barn disinfection and the treatment of the calves must be repeated in about 7 days. In this manner the calves and barn can be rid of these parasites.

UNIVERSITY PERCHERONS.

Eighteen head comprise the Percherons at Ohio State University at the present time. The stallion Libretto heads this stud. He is a descendant of Brilliant, tracing to this noted sire on both sides of his pedigree. Libretto is six years old and weighs 2000 pounds in breeding condition, dark gray in color, has superlative quality, clean cut features and general balance of conformation. In the show ring Libretto has demonstrated his merit, standing fifth at the International Horse Show in the aged class in 1916, being beaten by such horses as Lagos, for which Singmaster & Son, refused $10,000.

There are 8 brood mares due to drop foals this spring, four of these being in foal to Libretto the others to different sires. These mares are sired by such horses as Etudiant, Dorus, Intime, Furibond and Aglon the futurity sire.

One of the most highly prized brood mares is the mare Dopé, sired by Dorus he by Diamant an imported horse. Dope is not only a grand brood mare but in the show ring is equally renowned, having won the first Eastern Percheron Futurity held and in her two year old form was reserve American bred champion mare at Ohio State Fair. She is seven years old and is dam of four, all owned at the University. Her oldest foal a three year old has already dropped a colt this spring, her next foal a two year old is due to foal; she has a yearling filly and a stallion colt at her side.

The remainder of the young stock on

the farm are representatives of some of the best sires in Ohio and this establishment bids fair to soon rank among the leading farms in the country.

WM. C. SKELLEY, '18.

COLLEGE VEGETABLE GARDEN.

Due to the large number of students in the adjutant and aviation school at Ohio State University it became necessary to increase the size of the vegetable garden on the University farm this coming summer. The work is to be in charge of the College of Agriculture, and forces of men are at work getting the farm land bordering along the Olentangy river into condition. It is expected to furnish sufficient vegetables for the use of the Ohio Union this coming year, which in turn is expected to serve all of the students connected with the aviation branch at the University.

Last year the vegetable garden at the University farm, which was in charge of the Ohio Union, proved to be a big success. But due to the necessary increase of food production it was thought to be advisable for the Union to turn over its plans to the College of Agriculture. Under this new management greater results may be expected, due to the larger variety of vegetables that are to be raised and to the more scientific methods of culture that are to be applied.

E. J. GRENER, '18.

CORNER POST.

Corner posts set in concrete make a substantial and neat appearing job but unless care is taken in stretching the fence they will not give the best satisfaction.

Usually fences are stretched too tight when the end and corner posts

Keeping Quality of Milk

In order that a milk shall possess the keeping quality necessary to insure that the greatest satisfaction shall result from its sale every source of bacteria should be as far as possible removed.

Since bacteria imbeds itself in minute particles of grease and other foreign matter, that power of

Indian in Circle

In Every Package

Wyandotte Dairyman's Cleaner and Cleanser

to clean thoroughly every crack and crevice of dairy utensils is a factor which again proves the peculiar fitness of this cleaner in that it prolongs the keeping quality of the milk.

Nothing is of greater importance during this period of world strain than that everyone contribute his bit in the Nation's effort to conserve the food supply. Since the results produced by the use of this cleaner assist not alone in protecting the food value of your product, but your dairy profits as well, the reason is evident why it merits the preference of so large a number of users.

Every order for this cleaner is accepted on our money back guarantee. Order from your supply house. It Cleans Clean.

The J. B. Ford Co., Wyandotte, Mich., Sole Mfrs.

Once Over!

Think of what this means in saving of time and labor. You get a better seed-bed too, by using the famous

Cutaway (CLARK) Double Action Disk Harrow

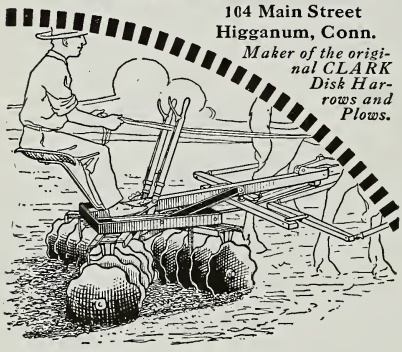
The rigid main frame makes the forged disks double cut, pulverize and level the ground. Close hitch. Light draft. All sizes.

Write for book telling how to raise better crops with less cost, "The Soil and Its Tillage," it's free, also new catalog. Ask for name of nearest dealer.

The Cutaway Harrow Company

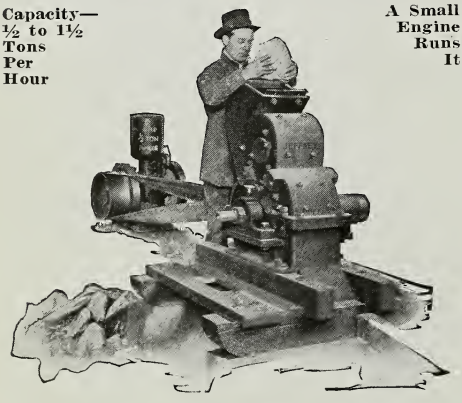
104 Main Street
Higganum, Conn.

Maker of the original CLARK Disk Harrows and Plows.



Capacity—½ to 1½ Tons Per Hour

A Small Engine Runs It



The LIMEPULVER JUNIOR

A New Jeffrey Limepulver at one-half the price of the smallest machine previously offered.

Operates with 6 to 16 H. P., depending on rate of feed and nature of material.

Grinds Limerock, Phosphate Rock, Alfalfa, Concrete Aggregates, Oyster Shells, Etc.

Get Facts Now—Order Early.

THE JEFFREY MFG. CO.

507 North Fourth Street, - Columbus, Ohio

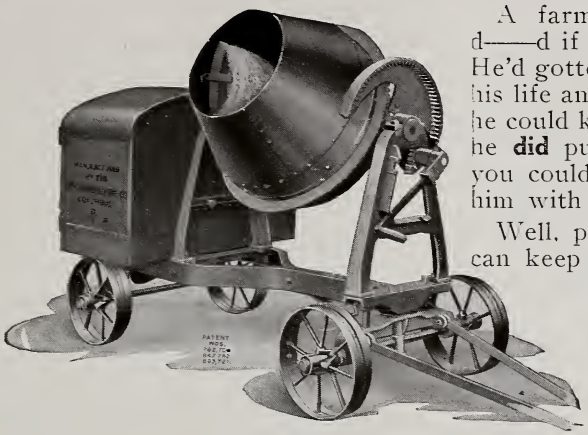
are set in concrete. Alternate expansion and contraction of the wire gradually draws the concrete set post from its hole. Wood, iron and concrete are the materials used for fence posts. Wood posts will last from 5 to 25 years. Their average cost being about 20 cents. Iron posts have advanced in price but they make a neat appearing and substantial fence. Both wood and iron posts should be set in concrete by placing the post in position and filling in the hole with cement.

Cement can be used to make corner posts. The mixture to use will vary from 1 part of cement and 3 parts of sand to 1 part of cement and 5 parts of sand or if gravel is used a 1-3-3 mixture will prove equally as good. The cement and sand should be measured and placed on a platform. The material is then mixed dry, three times by turning over the sand and cement with a shovel. The mixture is spread out forming a basin in the center. Small amounts of water are added and stirred with the mixture until it becomes of the desired consistency. Care should be taken to thoroughly mix the cement, sand and water together for upon this the strength and durability of the post will depend.

The cement is placed in a wood or steel form of the desired shape. This is accomplished in two ways, first, by tamping the cement in place, second, by mixing the cement thin enough so that it can be poured into the form. This is preferred as the post is made stronger, smoother and more durable, with a cost slightly above the tamped post.

Some farmers strengthen the post by placing twisted wire in the cement near the corner of the post. Concrete posts are sometimes reinforced by placing a wood post or pipe in the center of

Takes the Backache Out of Concrete Mixing



A farmer once said he'd be d——d if he'd put in a telephone. He'd gotten along without one all his life and he guessed "by Heck" he could keep on without it. Well, he **did** put a phone in and now you couldn't pry it away from him with a shot gun.

Well, perhaps you think you can keep on mixing concrete by hand. Just buy one of these little JAEGER MIXERS, and we'll bet you won't sell it back to us.

Ask us to send the Jaeger catalog.

JAEGER MACHINE COMPANY

522 DUBLIN AVE. **COLUMBUS, O.**

the posts. Wood has proved a failure since it will shrink and swell, thus breaking the post. The pipe has proved successful but is more expensive.

The posts are kept in the forms for 3 days; then they should be placed in a shed and left for 60 days. They should be kept moist the first 30 days.

Concrete posts will cost from 20 to 30 cents, depending upon their size and the material used to reinforce then; they will last a life, however. In the end they prove to be the most economical fence post.

It has been found that in a 5-inch post which projects 4 feet above the ground, a taper of 1 inch on each side from the ground line to the top insures an almost equal strength throughout. Cement corner posts of this size ought to be reinforced by a cement foundation and by braces.

Knox County. H. D. F. PINKLEY.

MOTOR TRUCK FOR MILK.

THAT the motor truck will be a great asset to the dairy business in the future where milk is shipped to nearby cities is shown by the fact that during the past three years a truck has been carrying the milk over a road for a distance of 18 miles into Cleveland as quick and cheap as on a train. This truck carries over 100 ten-gallon cans of milk. It brings the empty cans out in the morning, throws them off on its way out, and brings back the milk. The farmers place their milk on stands alongside the road and that is the extent of their trouble in delivering the milk.

Approximately 30 farmers ship milk on this truck. Previous to this shipping arrangement the farmers had to deliver their milk to railroad stands and had to load the milk. The time it took each farmer to make this trip

Pulverized Limestone
is the Best form of Lime to use on the Soil.

For Service

Prompt Delivery
Satisfactory Dealing

For Finely Pulverized Material

"BESSEMER"
Pulverized Limestone

Has No Superior.

Bessemer Limestone Co.

714 Stambaugh Bldg.
Youngstown, Ohio

varied from 1 to 2 hours a day according to the distance that he lived from the railroad station. Probably the average for the 30 farmers was 1 hour and 30 minutes. One hour and 30 minutes each day for the 30 farmers means a total expenditure of 16425 hours that previously was required per year for the farmers to deliver their milk. This makes 1642.5 working days of 10 hours each that has been saved for the farmers by this one truck. The wear that is saved on wagons and harness, and the cost of horse-shoeing also amounts to a large sum that can not be accurately determined.

The rate of transportation has been the same for both truck and train, but the amount of time it saves the farmers and the advantage that it gives them in getting out earlier to work in their fields has shown that the motor truck is a valuable asset to the dairy business. The only requirement needed for the truck is a solid road on which to run and just as rapidly as the roads of the country become improved the truck will be ready to assist the farmer in transporting his products.

H. E. WALTON, '19.

PAYS TO SOW LIME.

It pays to sow lime on a field which will not produce a good stand of clover.

One year ago we plowed under 8 acres of oat stubble which we harrowed three times and drug twice. With a lime drill we applied 2 tons of calcium hydroxide on the 8 acres, before sowing the wheat. Last summer we threshed 32 bushels of wheat per acre from this field which for the last 15 years has not yielded over 20 bushels per acre.

For several years we have not been able to get a good stand of clover but last year a thick and rank growth of clover was raised on this field; so rank

was the growth that we were forced to pasture the field to prevent the young clover from going to seed.

Thus with the addition of 500 pounds of lime per acre we received a gain of 12 bushels of wheat per acre and an excellent clover set besides.

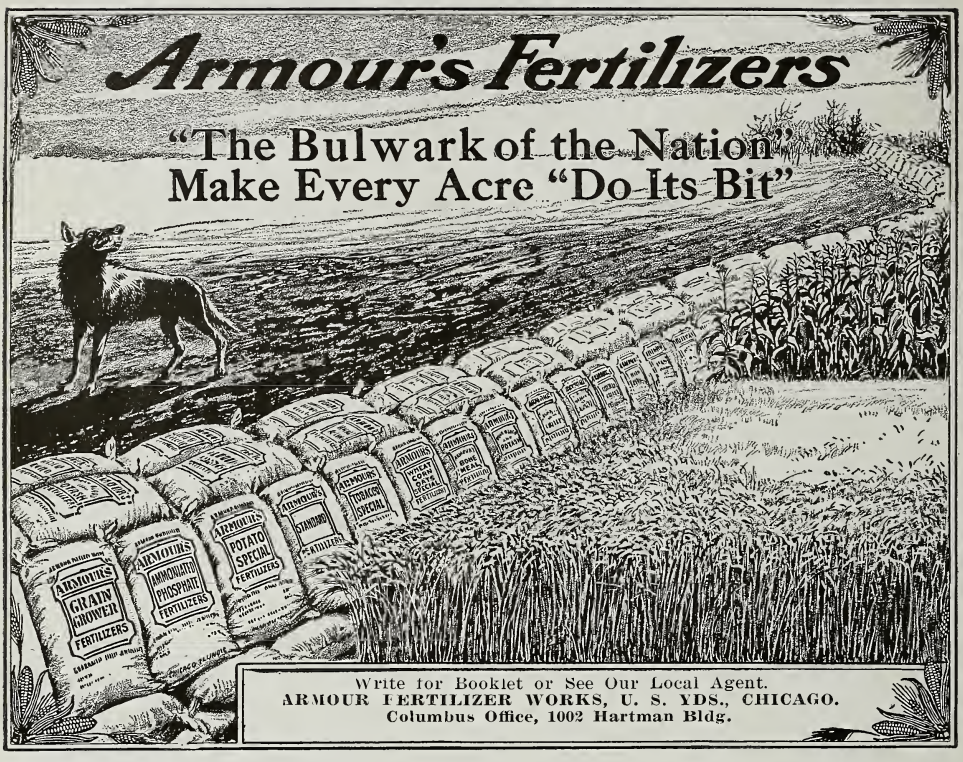
CULTIVATE CORN SHALLOW.

BY shallow cultivation given the intertilled crops the farmers can secure slight increases in yields with less expense of labor and energy.

For what purposes are crops cultivated? The chief and foremost purpose is to increase their yields. This is accomplished by destroying weeds and providing moisture for the growing crops. Every farmer will say that corn should be plowed after a rain. Why? Because he knows that a crust will form on the surface of the soil which will interfere with the moisture supply available for the crop. Cultivation breaks this crust and forms a soil mulch which greatly checks the evaporation of moisture from the soil into the air.

Since increased yield is the object of cultivation, is it necessary to cultivate deep? Observation has taught us that there is but little visible difference between shallow and deep cultivation of corn if the seed bed was properly prepared. The Illinois Agricultural Experiment Station has proven conclusively that the only profitable advantage in cultivation is to kill weeds.

Can these objects be accomplished by deep cultivation? There is no doubt but what they can, but is it profitable? It certainly would not do an injustice to an intertilled crop to cultivate deep when the crop is young. Because one is able to cultivate close to the row of plants and thereby loosen the soil for the roots to make a rapid growth. It



would also uproot the young weed crop and throw other weed seeds to the surface to germinate. These can be killed by the second cultivation and by this time the average field is free from weeds. By this time the young roots are making a rapid growth. These roots are spreading out in all directions from the plant, and are found near the surface of the soil. Over three-fourths of the roots of the corn crop are found within the first 7 inches of the soil, the usual plow depth. The effect that deep cultivation would have upon the crop at this stage of its development is obvious. Every farmer has seen the broken roots of the corn clinging around his cultivator shovels. The deeper the cultivation the greater is the number of roots severed from the plants.

What effect has this on the crop? It cuts off many roots; but most serious of all is the fact that most of the roots are torn loose from the soil particles around which they cling. Thus, they are severed from their source of food materials. By shallow cultivation these objections can be overcome and the weeds can also be kept down, besides this requires less energy and horse labor.

Potatoes may likewise be cultivated deep during their early growth; but later it is advisable to cultivate shallow because deep cultivation tends toward ridging the soil. This exposes more surface of the soil to the air and greater evaporation takes place. Thus it leads to a slightly decreased yield. By the soil drying out the potatoes lose a part of their flavor and thus take on an inferior quality.

L. N. GEIGER, '18.

EMPIRE
MILKING MACHINES

The Recognized Standard

NEARLY every field of endeavor has its recognized standard—one manufacturer's goods that always loom up first in your mind when a product of its nature is mentioned. It's true of cameras, pianos, locks, crackers, speedometers, watches and a host of other products.

And it's true of Milking Machines.

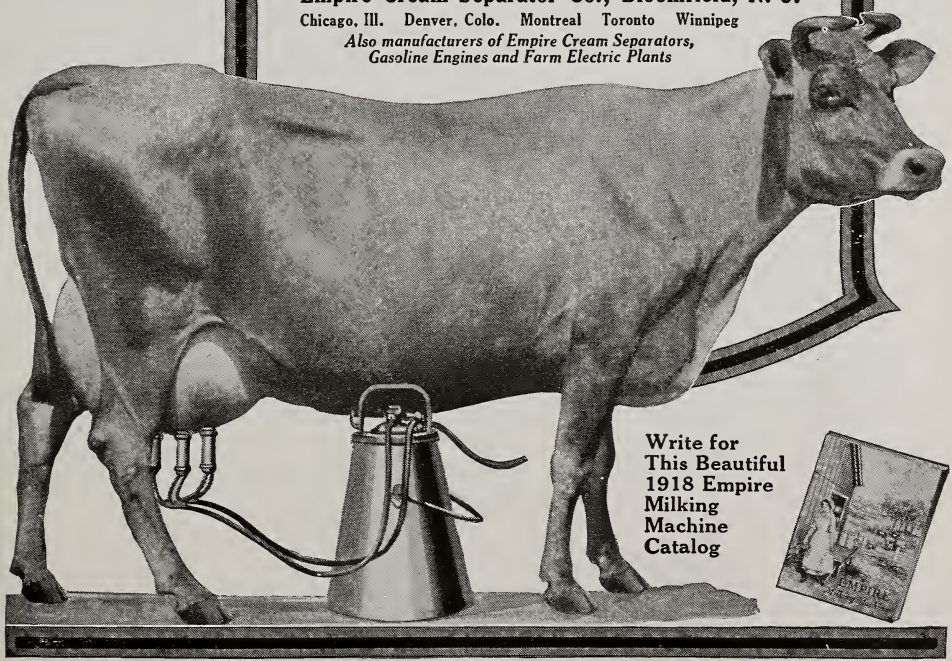
Visit the homes of prize winning stock of all breeds, go to the dairy farms whose chief object is the production of large quantities of milk or go to the small farmer who has only a limited number of cows: everywhere you'll find the dominating milking machine to be the Empire.

Our 1918 Catalog No. 76, will tell you why or, if you choose, the local Empire dealer will demonstrate why. No charge or obligation.

Empire Cream Separator Co., Bloomfield, N. J.

Chicago, Ill. Denver, Colo. Montreal Toronto Winnipeg

Also manufacturers of Empire Cream Separators, Gasoline Engines and Farm Electric Plants



Write for This Beautiful 1918 Empire Milking Machine Catalog

CARE OF CREAM.

Cream kept cool in the summer prevents it from becoming sour, thus preventing the formation of undesirable odors and flavors.

As soon as the cream is skimmed or separated from the milk it should be poured into a clean container of the desired size and placed in a drain which is kept cool by running water.

The object of cooling cream is to prevent the formation of undesirable odors and flavors which are apt to form during the souring of milk.

If the milk is kept at about 60 degrees the formation of lactic-acid bacteria will take place most readily. The formation of lactic-acid is desirable because it gives to butter the best odor, flavor and aroma.

Sweet cream free from undesirable odors and flavors sells at a higher price, it is also easier to test, thus the producer will get a higher test at the creamery.

I. P. Lewis, '17, is engaged in horticultural work at the Ohio Experiment Station at Wooster.

Clay B. Eddy, '17, is in the Navy.

Frederick J. Trapp, '17, is in Battery C of the Heavy Field Artillery at Camp Sherman.

Paul McClure, '16, is in the Aviation school at Urbana, Illinois.

George Valley ,'17, is doing analytical work in the agricultural chemistry department at Ohio State University.

Thomas L. Guyton, '13, who has been at the Ohio Experiment Station has accepted a position at the Pennsylvania Station under Professor Sanders.

Virgil Overholt, '15, has finished the Third Officers' Training Course at Camp Sherman and has been sent to South Carolina.

Nitrapo

15% Nitrogen
15% Potash

Highest grade fertilizer material offered. Solves the potash problem. On basis of plant food analysis cheapest source of ammonia and potash. Write us for prices and further information. Can make prompt shipments from Columbus, O.

Nitrate Agencies Co.
Cent. Nat. Bank Bldg.
Columbus, Ohio.

MERIDEL FARM DUROCS

THE POPULAR KIND

Just in printer's hands—Catalogue showing breeding, description and price of **1917 FALL PIGS and BRED TRIED SOWS.**

Always Glad to See You.

MERIDEL FARM, BLACK LICK, OHIO

Where Good Sows and Good Boars Meet.
On East Broad Street, 9 Miles East of Columbus.
2 Miles from Black Lick. **3 Miles from Reynoldsburg.**

Cow Health is Dairy Wealth

Safeguard the health of your herd by building stables that will be clean, sweet and sanitary. Easily done if you build with Natco Hollow Tile. Germs can't hide on the smooth glazed walls. A blanket of dead air in Natco walls keeps the stable warm in winter and cool in summer—prevents dampness and mildew.

Natco on the Farm

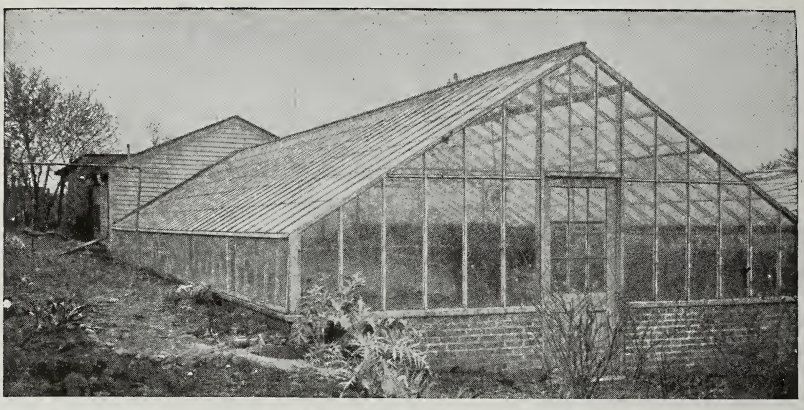
means healthier stock, cleaner and better milk—bigger profits and more dairy wealth. Natco Hollow Tile has fire-proofed most of the great "skyscrapers" of our large cities. The same material will protect your stock, grain and tools from the fire peril and will lower insurance charges. Natco buildings save painting and repairs. They cost less than other forms of masonry yet add greatly to the value of your farm.

Your building supply dealer will gladly show you samples and practical building plans. He has, perhaps, just the plan for which you're looking. But write us direct today for new illustrated "Natco on the Farm" book —1918 Edition —it's free!

National Fire Proofing Company
1132 Fulton Building Pittsburgh, Pa.
23 Factories assure a wide and economical distribution.

BIGGEST BUY IN THE WORLD

46 Douglas Building Columbus, Ohio Bell, Main 4614



A Small Greenhouse like this does not cost very much and pays for itself by producing two extra crops a year.

A Money-Making Addition For Your Farm

THIS 50 ft. greenhouse will help you make money twelve months a year, every year.

While your neighbor, Mr. Outdoor Farmer, is getting his ground ready for spring plowing, YOUR plants can be well started.

Not being subject to the uncertainties of spring weather you will not suffer loss from early frost or hard rains or any of the other calamities that befall most farmers.

And there are two additional crops every winter, when fresh vegetables bring big prices at the city markets.

A Greenhouse makes farming an all-year-round proposition.

Send for our interesting booklet which tells all about vegetable growing under glass.

Lord & Burnham Co.

Builders of Greenhouses and Conservatories

SALES OFFICES

NEW YORK, 42nd St. Building
BOSTON, Tremont Building.
PHILADELPHIA, Widener Building.
ROCHESTER, Granite Building.
CHICAGO, Continental and Commercial Bank Building.
CLEVELAND, Swetland Building.
TORONTO, Royal Bank Building.
MONTREAL. Transportation Building.

FACTORIES

Irvington, N. Y.
Des Plaines, Ill.
St. Catharines, Canada.